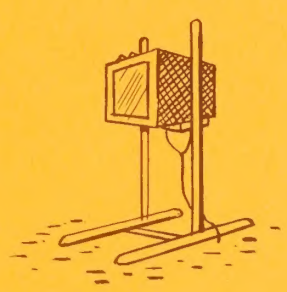
TUBERCULOSIS SERVICES IN CANADA

MEMORANDUM NUMBER 11
GENERAL SERIES
RESEARCH DIVISION



DEPARTMENT OF NATIONAL HEALTH AND WELFARE
OTTAWA
AUGUST 1955

TUBERCULOSIS SERVICES IN CANADA

GENERAL SERIES
Memorandum No. 11

Research Division,
Department of National Health and Welfare,
September, 1955.

FOREWORD

The encouraging progress which has been made in overcoming tuberculosis should in no way obscure the ever present threat of this disease to our population, or the knowledge that among certain groups it remains high among the leading causes of death and disability. It is hoped that this brief description of tuberculosis services in Canada will be of assistance to those health administrators and others who are concerned with the fight against this disease.

While this report was originally prepared as a Chapter of the volume Canada's Health Services, to be published in 1955 by the Research Division, it was believed that there would be sufficient interest in this account of Canada's tuberculosis services to justify its separate publication, as a bulletin for the special use of those particularly interested.

The Research Division wishes to acknowledge the help given in the preparation of this work by Dr. G.J. Wherrett, Executive Secretary of the Canadian Tuberculosis Association, and by Dr. B.D.B. Layton, Principal Medical Officer Research Development and Dr. E.H. Lossing, Chief of the Epidemiology Division of the Department of National Health and Welfare. Their generous assistance in reading and commenting on the manuscript and the many helpful suggestions they made greatly contributed both to the pleasure of preparing the work and to its effectiveness as a reference document.

Joseph W. Willard,
Director, Research Division.

I59
8.55

TABLE OF CONTENTS

I59
8.55

TABLES

CHARTS

Number

TUBERCULOSIS SERVICES IN CANADA

During recent years, one of the great achievements in the public health field has been reflected in a decrease of tuberculosis. Control programs have resulted in a significant decline in death rate and in the incidence of active cases. Sanatorium care is now available to more of the patients who have this disease.

As shown in Table 1, the number of deaths from tuberculosis fell from 8,744 in 1926 to 1,810 in 1953, despite a population increase of 50 per cent during the intervening period. While this downward trend has been evident for many years, it has accelerated since around 1947, as indicated in Chart 1. In 1953, a tuberculosis death rate of 12.3 per 100,000 population was the lowest ever recorded in Canada(1) and among the lowest in the world. Chart 1 also demonstrates that while the Indian death rate is roughly ten times that of the white population, it has decreased more rapidly in recent years.

The declining death rate is not limited to any single area in Canada. As evidenced by Chart 2, all provinces have experienced a similar decrease.(2) Rates for the various provinces continue to differ, however, varying from a high of 29.0 per 100,000 population in Newfoundland to a low of 5.6 to 5.9 in Saskatchewan, Alberta and Ontario, but over the years there has been a constant narrowing of the spread from the highest to the lowest rate.

The number of patients receiving treatment in tuberculosis sanatoria has continued to grow. From 1948 to 1953, total admissions to such institutions increased from 16,830 to 21,206. During the same interval new admissions rose from 9,750 to 11,137 and readmissions from 4,259 to 4,382.(3)

---

(1) D.B.S. Tuberculosis Statistics, 1953, 133. The death rate from tuberculosis of the respiratory tract was 9.9 and of other organs 2.4 per 100,000 population.

(2) Figures on which Chart 1 is based do not include deaths among the Indians; if these were included, Ontario would have the lowest death rate in Canada (6.4 per 100,000 population), closely followed by Alberta (6.8 per 100,000 population).

(3) D.B.S. Tuberculosis Institutions, 1948 to 1952 and D.B.S. Tuberculosis Statistics, 1953. The 1948 figures are adjusted to include Newfoundland.

TABLE I NUMBER OF DEATHS FROM TUBERCULOSIS, INDIANS AND ALL OTHER RACES: BY PROVINCE AND CALENDAR YEAR, 1926 TO 1953(a)

Calendar Year	Nfld		P.E.I.		N.S.		N.B.		Que.		Ont.		Man.		Sask.		Alta		B.C.		Canada(b)		
	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Indian	Other	Total Population
1926		625		91		665		433		3,366		1,864		390		391		369		547	(c)	(c)	8,744
1930		573		103		552		393		3,402		1,805		462		412		411		624	(c)	(c)	8,737
1935		577		60		488		335		2,813		1,303		432		272		329		565	704	6,470	7,174
1940		518		56		415		295		2,503		1,011		369		241		321		578	(c)	(c)	6,307
1944	-	500	2	56	12	345	11	227	67	2,557	131	937	152	196	68	154	116	175	168	349	727	5,496	6,223
1945	-	447	3	39	10	328	17	249	53	2,502	127	888	129	186	82	145	111	152	172	353	704	5,289	5,993
1946	-	402	1	54	8	374	11	266	58	2,567	112	940	141	183	71	150	115	185	206	369	723	5,490	6,213
1947	-	428	4	59	13	296	8	253	63	2,373	142	900	128	180	81	150	89	174	174	362	702	5,175	5,877
1948	-	358	-	37	8	239	5	225	80	2,136	97	728	139	149	75	154	81	178	154	288	639	4,492	5,131
1949	-	285	-	22	5	179	10	185	63	1,834	83	603	110	114	74	111	72	139	108	298	525	3,770	4,295
1950	-	247	2	27	2	174	9	150	46	1,525	76	509	79	100	63	90	52	119	74	239	403	3,180	3,583
1951	-	256	-	17	3	123	6	128	55	1,498	54	525	60	98	73	83	45	101	76	216	372	3,045	3,417
1952	-	175	-	24	2	92	2	98	38	1,070	41	357	31	84	50	54	40	85	35	179	239	2,218	2,457
1953	-	111	-	13	3	69	3	66	17	827	22	289	26	63	40	47	13	55	24	122	148	1,662	1,810

(a) Segregation of Indians from all other races by province, was not available before 1944.

(b) Figures for deaths from tuberculosis in Yukon and Northwest Territories are not available.

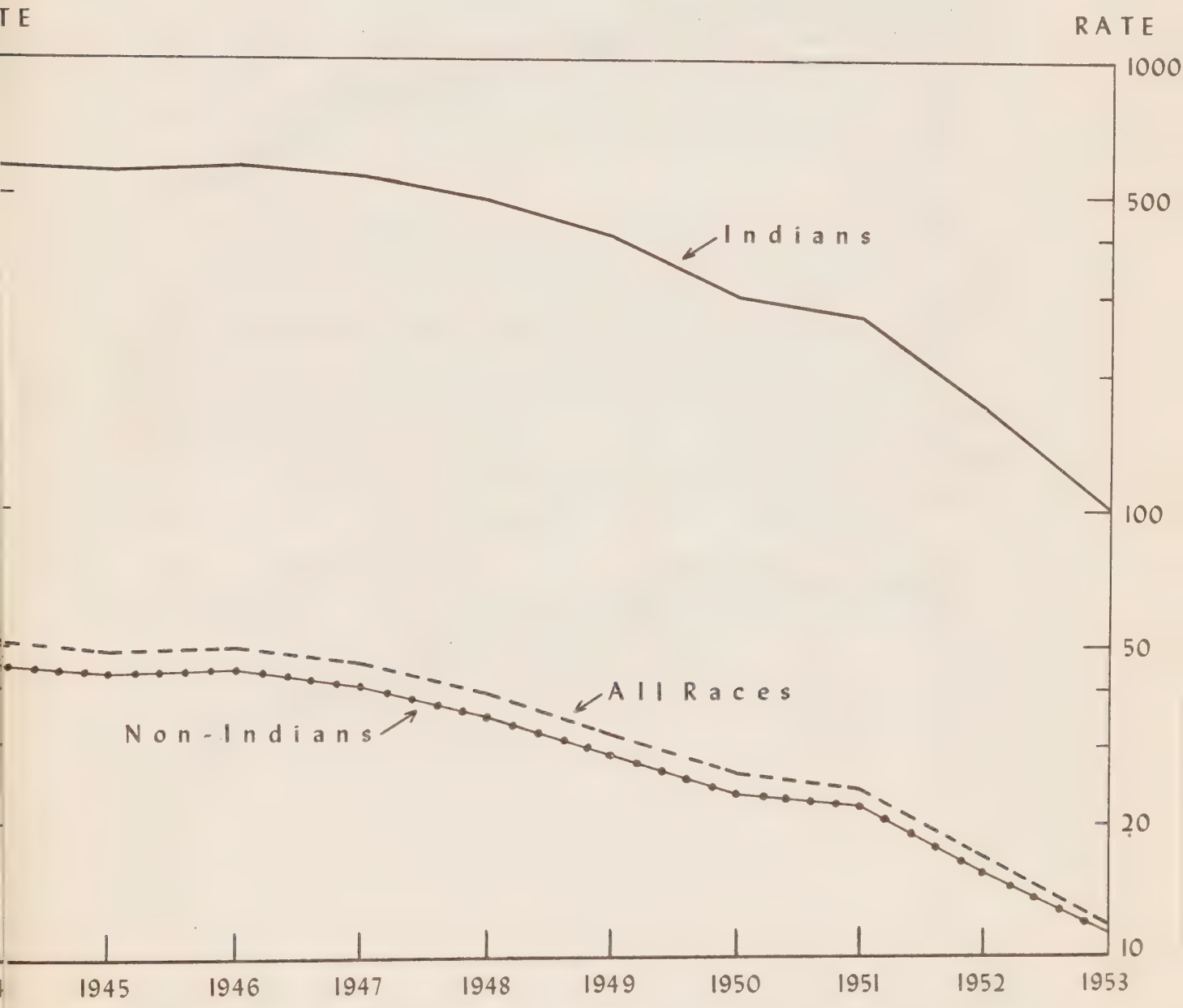
(c) Figures are not available.

Sources: Canadian Tuberculosis Association, Annual Reports, 1944 to 1953.
D.B.S. Tuberculosis Institutions, 1937 to 1953.
Registrar General of Births, Marriages and Deaths, Newfoundland, Annual Reports, 1946 to 1948.

CHART 1

RUDE DEATH RATES PER 100,000 POPULATION FROM TUBERCULOSIS, 1944 TO 1953

Semi-Logarithmic Scale



Based on Data From the Annual Reports of the Canadian Tuberculosis Association

CHART 2

CRUDE DEATH RATES PER 100,000 WHITE POPULATION FROM TUBERCULOSIS, BY PROVINCE, 1944 TO 1953

Semi-Logarithmic Scale

Source: Based on Data From the Annual Reports of the Canadian Tuberculosis Association

Chart 3 shows that admission rates have increased for both males and females in all age groups between 1938 and 1953. For females, the increase has been reasonably uniform for all ages, but for males there is a much greater increase for patients over 50 years of age.

In contrast to admission rates, death rates have declined sharply for both males and females throughout the age range. The more marked fall in the death rate for women outlined in Chart 3 has resulted from the sharp reduction of deaths in the younger age group from 20 to 30 years, and the fact that the fall in female death rates has been maintained up to the older ages. Death rates in the older age groups of the male tuberculosis cases have not declined nearly as rapidly as the corresponding rates in other age groups for the males or in any of the female age groups. Since 1951, however, there has been a significant decline even among the older males.

Chart 4 illustrates the contrast in trends for cases reported, death rates and admissions to tuberculosis institutions from 1935 to 1953. The upward trend for cases reported which persisted to about 1945 was in the opposite direction to the declining death rate; in recent years there has been a sharp drop in numbers of cases reported, which parallels roughly the decline in the death rate. The institutional population is being maintained by the admission of moderate and minimal cases; the upward trend in admission rates has persisted for these groups, while the rate for far-advanced cases has shown a slight decline. This evident tendency towards earlier discovery of new cases is supported by data available from tuberculosis clinics and x-ray surveys.

A comparison of the results of x-ray surveys and admissions to sanatoria by stage of disease from 1946 to 1953 is presented in Chart 5. The great increase in minimal cases found on x-ray surveys is in sharp contrast to the lack of a corresponding increase in admissions of such cases to institutions. Assuming consistency of diagnosis at surveys and institutions, this suggests that many minimal cases have not required institutional care.

Bed facilities in sanatoria have increased considerably during the past few years. By the year 1954, the discharge rate was sufficient to enable most provinces to accommodate all new cases requiring hospital care; in every province waiting lists have either been eliminated entirely or reduced to manageable proportions. Modern surgical and chemical therapies are available in all provinces.

Despite advances, however, tuberculosis remains a major challenge to public health. A disease which was directly responsible for an average of 17,364 hospitalized Canadians every day during 1953 and for 11,137 new admissions during that year cannot, in any respect, be considered conquered.

FEDERAL TUBERCULOSIS SERVICES

In Canada, tuberculosis control programs are conducted primarily by the provinces. Federal participation has been limited to providing services for special groups such as war veterans, immigrants, Indians and Eskimos, and to assisting the provinces through the Tuberculosis Control Grant.

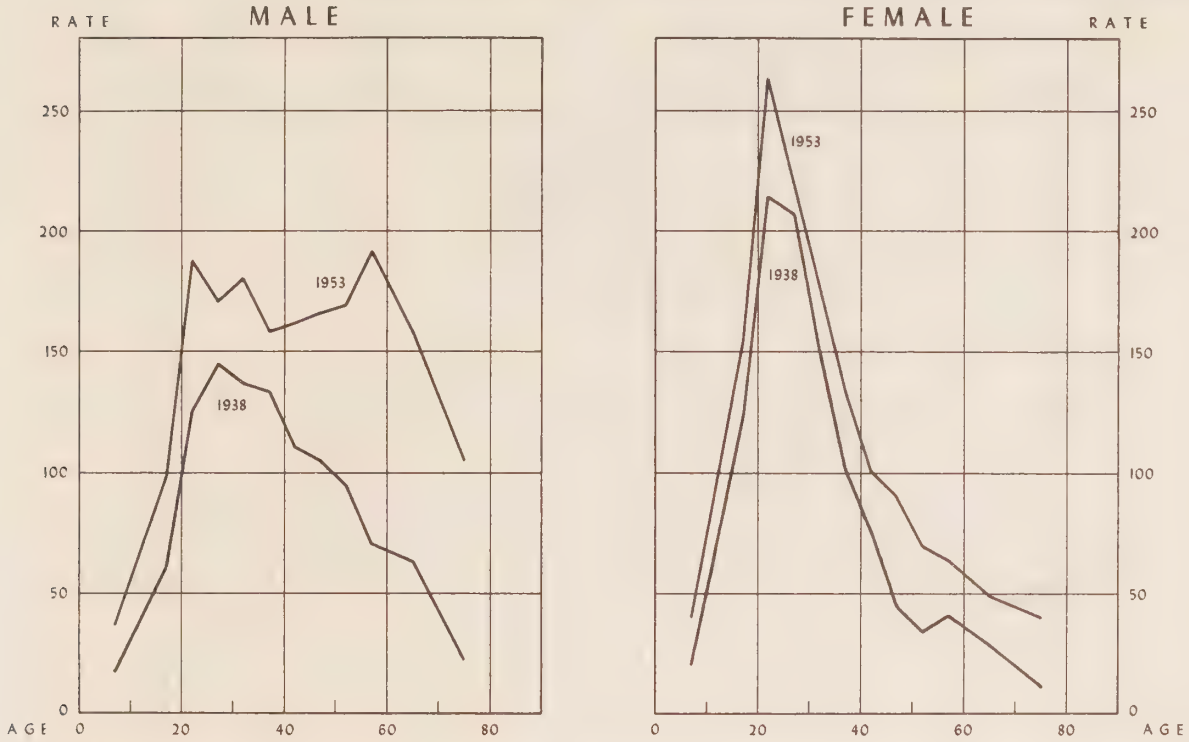
WAR VETERANS. The Department of Veterans Affairs maintains some beds in the federal veterans hospitals for tuberculous ex-service personnel. On December 31, 1953, 852 patients were receiving therapy - 410 in federal hospitals and 442 in provincial institutions.

IMMIGRANTS. The Immigration Medical Services of the Department of National Health and Welfare provide special diagnostic services to detect potential cases of tuberculosis. Most people who intend to immigrate to Canada receive complete medical examinations including chest x-rays when they apply for passports or visas; all are checked on arrival in Canada and when indicated, a complete examination including x-ray is given.

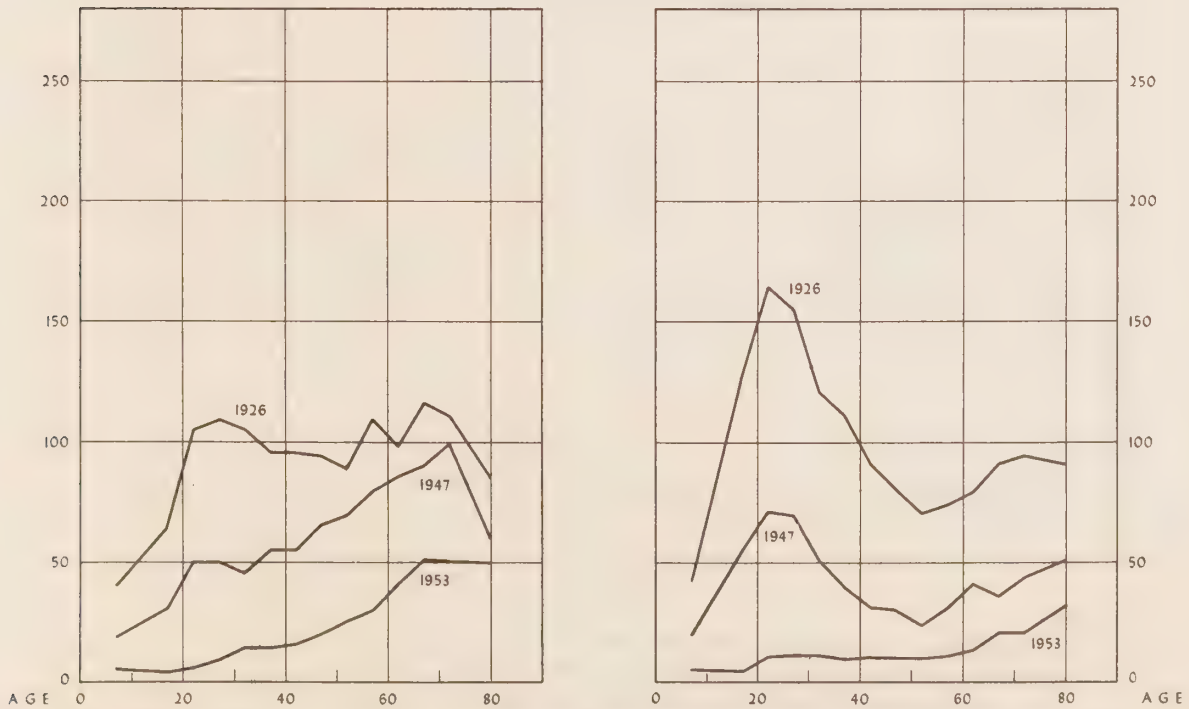
INDIANS AND ESKIMOS. Federal health services for Indians and Eskimos, including a special anti-tuberculosis program, have evolved to augment the care normally provided by the home, the community and the provinces. In 1938, the Department of Mines and Resources which directed Indian

CHART 3

ADMISSIONS TO TUBERCULOSIS INSTITUTIONS AND TUBERCULOSIS DEATHS, (all sites): RATES PER 100,000 POPULATION, SPECIFIC AGE AND SEX, CANADA, FOR SELECTED YEARS 1926 TO 1953



Admissions to Tuberculosis Institutions, Age and Sex Specific Rates, Canada, 1938 and 1953

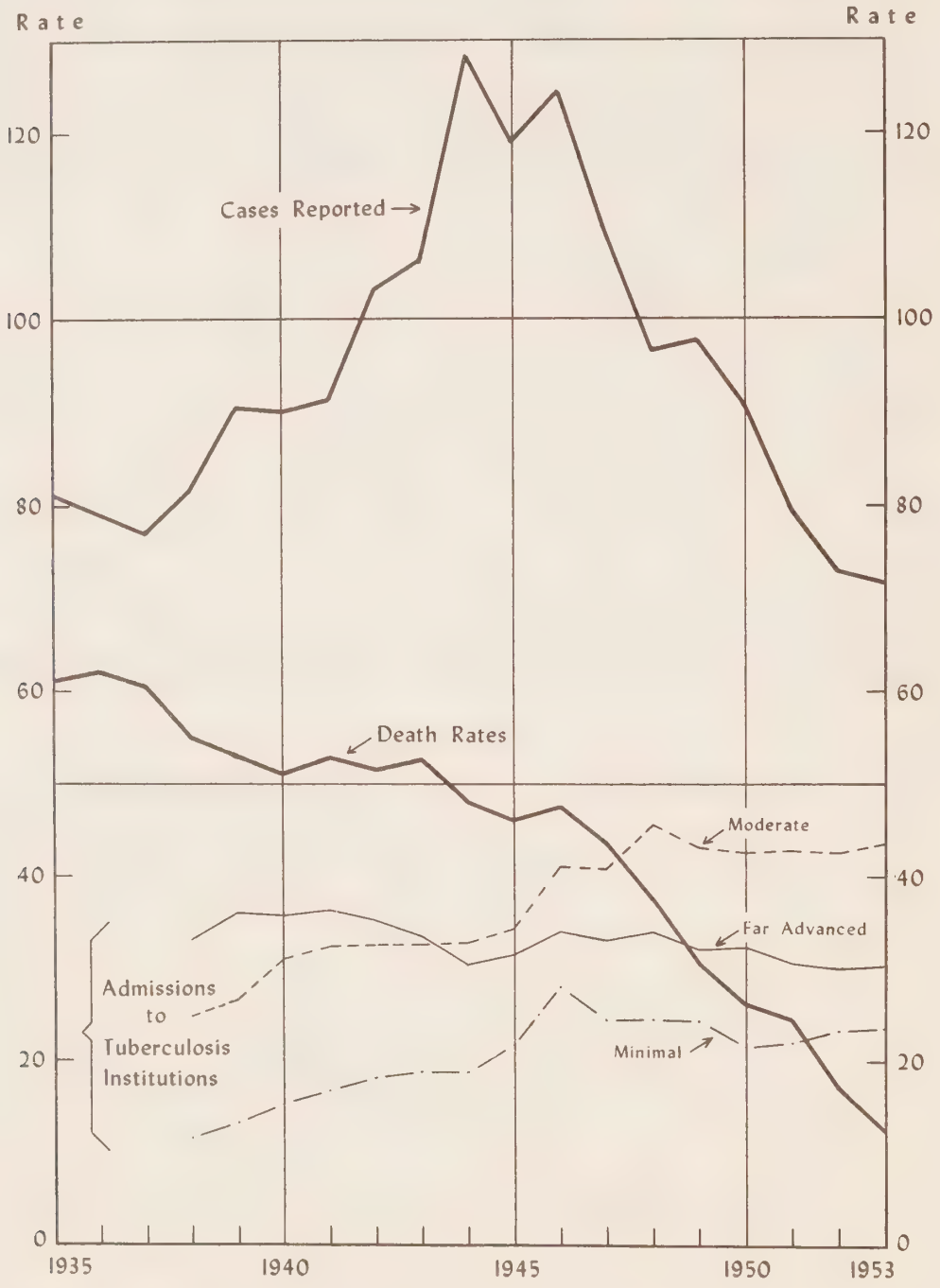


Deaths from Tuberculosis (all sites), Age and Sex Specific Rates, Canada, 1926, 1947 and 1953

Source: (1) Annual Reports of Tuberculosis Institutions - D.B.S.
(2) Annual Reports of Vital Statistics - D.B.S.

CHART 4

TUBERCULOSIS DEATH RATES (all sites), TUBERCULOSIS CASES REPORTED AND ADMISSIONS TO TUBERCULOSIS INSTITUTIONS: RATES PER 100,000 POPULATION, CANADA,* 1935 TO 1953



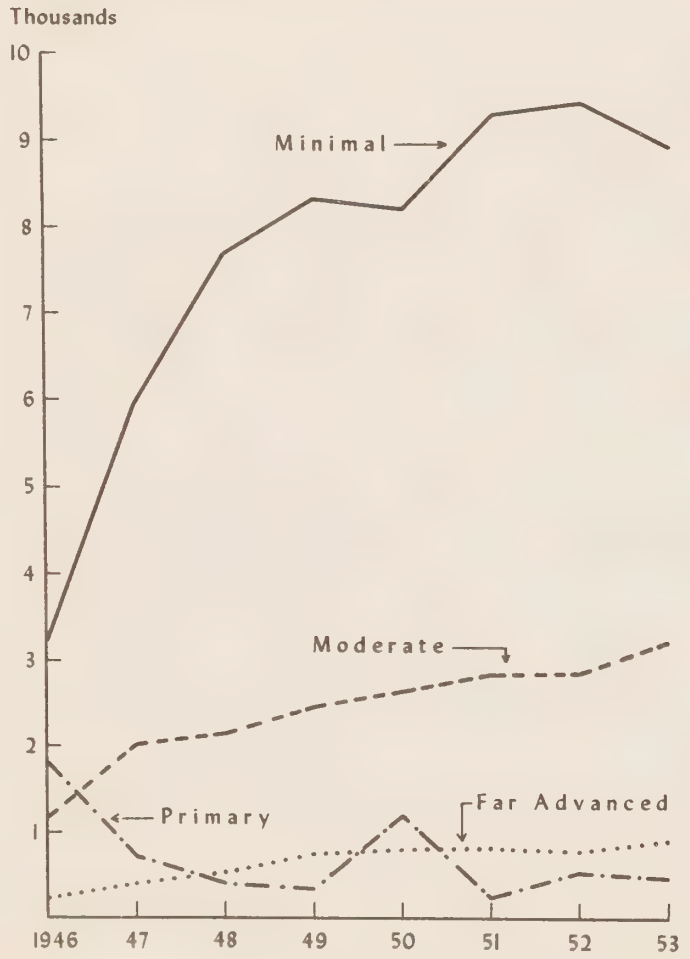
*Excludes Newfoundland Prior to 1950

SOURCES:

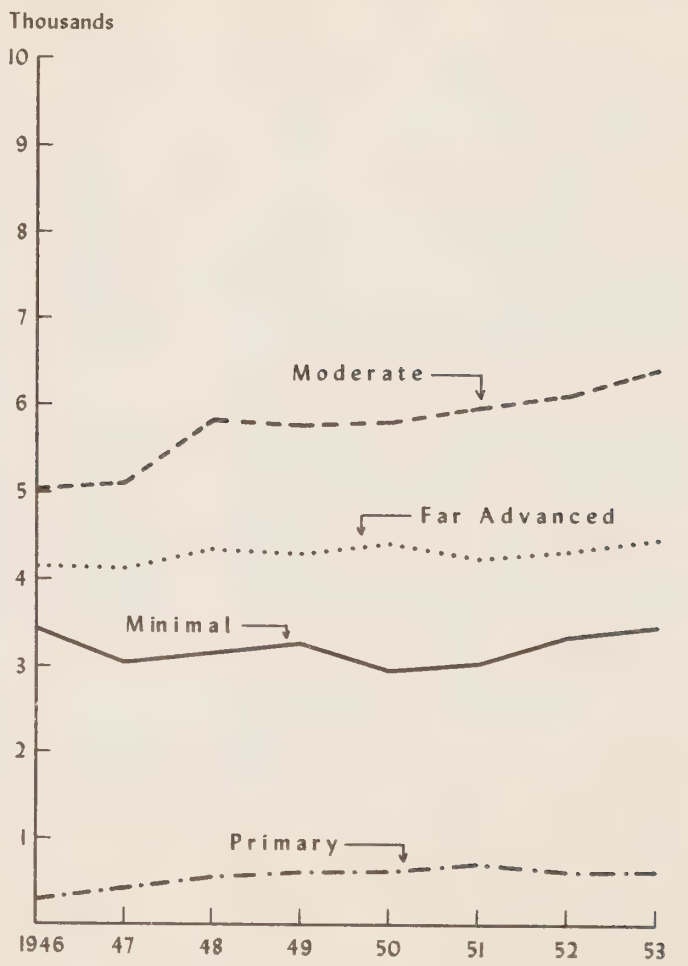
1. Summary of Notifiable Diseases 1924 - 1952 - D.B.S.
2. Annual Reports of Vital Statistics - D.B.S. (1935 - 1953)
3. Annual Reports of Tuberculosis Institutions - D.B.S. (1938 - 1953)
4. Annual Report of Notifiable Diseases - D.B.S. 1953

PULMONARY TUBERCULOSIS BY STAGE OF DISEASE, DIAGNOSTIC X-RAY SURVEYS AND ADMISSIONS TO TUBERCULOSIS INSTITUTIONS, CANADA,* 1946 TO 1953

DIAGNOSTIC X-RAY SURVEYS



ADMISSIONS TO TUBERCULOSIS INSTITUTIONS



*For Diagnostic Surveys Excludes Quebec all Years; For Both Charts Excludes Newfoundland Before 1950 and Yukon & N.W. Territories all Years

Source: Annual Reports of Tuberculosis Institutions 1946 to 1953, D.B.S.

health services until 1945 launched an intensive case-finding program to discover and treat active tuberculosis among reservation Indians; however, this was interrupted by World War II and activities were not resumed until 1944 when an Advisory Committee on the Prevention and Control of Tuberculosis among Indians was established. The resultant recommendations have been gradually implemented. Late in 1945, direction of Indian and Eskimo health services was transferred to the recently organized Department of National Health and Welfare.

At the close of the war, the Directorate of Indian Health Services acquired several hospitals originally built for defence purposes and a rapid expansion of treatment facilities followed. Case-finding and diagnostic services, too, were improved and greater use was made of existing quarters.

Case-finding and Diagnosis. Before 1945, case-finding had relied chiefly on x-ray surveys conducted by various provincial tuberculosis control units in the Indian residential schools. The opening of the new sanatoria, general hospitals and field units along with improved travelling facilities in Northern Canada enabled the authorities to extend the original program of case-finding and x-ray diagnosis to all Indians and Eskimos.

In the areas east of James Bay the federal Directorate provides some staff and equipment to provincial survey units, sanatoria and community hospitals which make their diagnostic and case-finding facilities available to the Indians and Eskimos as well as the white population. The Directorate cooperates with the western provinces in providing mobile x-ray teams that travel to any area where their services are needed. Special survey teams such as the medical party that accompanied the Eastern Arctic patrol vessel, "C.D. Howe", in 1952 may cover more remote northern areas. The team was comprised of two medical officers, a dental surgeon and his assistant, and an x-ray technician. During the tour along the Arctic coast, the technician took 1,007 chest x-rays of which 113 revealed pathological conditions. Simultaneously another team, operating by air transport, worked in the Western Arctic region. The number of x-rays taken by such mobile units increased from 40,000 in 1949 to at least 60,000 in 1954. Moreover, all hospitals maintained by the Directorate of Indian Health Services conduct routine x-ray examinations of all patients admitted.

All programs are making more and more use of B.C.G. vaccine.(1) In addition to routine x-rays, tuberculin tests are administered to all children in the residential schools and negative reactors are vaccinated. Many community hospitals, too, cooperate by vaccinating all newborn Indians. Follow-up work with suspects and contacts is extremely difficult among the small nomadic bands but both the mobile teams and other interested groups are doing increasingly effective work.

Treatment. On December 31, 1940, roughly 100 Indians and Eskimos were receiving care in various sanatoria. By 1946, the number had risen to 999 and by the end of 1954, to 2,934. An increasing number is being treated in federal hospitals equipped for most modern surgical and chemical therapies.(2)

Treatment is provided directly through federal facilities or by arrangement with provincial sanatoria and other hospitals which are reimbursed at per diem rates. Eight departmental sanatoria with a total of 1,785 beds are located in Ontario and the Western provinces. The largest centre is the Charles Camsell Indian Hospital at Edmonton with 580 beds. In Quebec and the Maritime provinces, Indians and Eskimos are treated mainly in provincial sanatoria and in the Parc Savard Immigration Hospital at Quebec City. Northern Indians and Eskimo patients are usually cared for in mission hospitals operated by religious groups.

Rehabilitation and Education. The Directorate of Indian Health Services and the Indian Affairs Branch of the Department of Citizenship and Immigration are jointly responsible for the rehabilitation of tuberculous Indians and Eskimos. Federal sanatoria provide occupational training including instruction in handicrafts while the Indian Affairs Branch re-establishes ex-patients on reserves and provides supplementary diets to convalescents and their families.

Professional medical staffs emphasize prevention and early treatment while other educational personnel utilize

---

(1) B.C.G. is the standard abbreviation for Bacillus-Calmette-Guerin.

(2) On December 31, 1946, of the 999 Indians and Eskimos hospitalized for tuberculosis, 412 (42 percent) were in federal institutions; on the corresponding date in 1954, 1,523 (52 percent) were being cared for in federally maintained sanatoria.

various media such as films, posters and instructional talks. A special film strip, "The Starlight Story", describing the onset, treatment and recovery in terms of a specific case, has been received enthusiastically by both Indians and Eskimos.

THE NATIONAL HEALTH PROGRAM. Tuberculosis control is one of the oldest of provincial programs concerned with a specific disease. Five provinces had provided free treatment for pulmonary tuberculosis before 1948, and in other provinces provincial and municipal funds were meeting an increasing proportion of the cost. Voluntary agencies, too, shared in building sanatoria and establishing case-finding services.

In May, 1948, a Tuberculosis Control Grant, designed to enable the provinces to establish new services and to extend existing programs, was initiated as a part of the new National Health Program. Through this grant $3,000,000 were made available to the provinces, to be distributed on the basis of a flat grant of $25,000 to each with 50 percent of the remainder allocated according to population and 50 percent according to the average number of deaths from tuberculosis during the preceding five year period.(1) In March, 1951, the grant was raised to $4,000,000 per year.

During the next six years, well over $23,000,000 were allocated(2); of this sum, 89.8 percent were expended.(3) The rate of utilization, however, varied considerably from province to province, ranging from 61 percent in Manitoba to well over 100 percent in Quebec. Allocations, expenditures and the rates of utilization are shown by province in Table 2.

---

(1) With Newfoundland's entry into confederation in 1949, the total grant available to the provinces was raised to $3,176,614.
(2) This includes the fiscal years 1948-49 to 1953-54.
(3) There has been a steady growth in utilization over the six year period. In 1948-49, 85 percent were spent; in 1951-52, 94 percent and in 1953-54, 105 percent (the excess over 100 percent was transferred from other grants).

Major projects in the case-finding and diagnostic fields have included the establishment of free chest x-rays for both in and outpatients of hospitals, the provision of both maintenance funds and equipment for mobile and stationary diagnostic clinics and mass x-ray units and the extension of the use of B.C.G. vaccine. Since the cost of drugs has been met through the grant, Canada has rapidly adopted new therapeutic techniques such as the use of streptomycin. Similarly, the extension of both staff and equipment in provincial sanatoria has accelerated the use of improved surgical techniques.

TABLE 2. EXPENDITURES UNDER THE TUBERCULOSIS CONTROL GRANT: BY PROVINCE, FISCAL YEARS 1948-49 TO 1953-54 INCLUSIVE

Province	Amounts Available, in $ Thousand	Amounts Expended, in $ Thousand	Percentage Expended(a)
Newfoundland	1,041	872	89.8
Prince Edward Island	315	258	81.9
Nova Scotia	1,246	1,299	104.2
New Brunswick	1,032	952	92.2
Quebec	7,932	8,825	111.2
Ontario	5,529	3,833	69.3
Manitoba	1,346	824	61.2
Saskatchewan	1,257	1,165	92.7
Alberta	1,369	1,169	85.4
British Columbia	2,018	1,555	77.1
Yukon and Northwest Territories	26	13	50.0
Canada	23,112	20,765	89.8

(a) Since April 1, 1951, regulations governing the health grants have permitted the transfer of unused portions of one grant to another. Expenditures may therefore exceed 100 percent of the amount available.

Source: Dept. N.H.& W., Directorate of Health Services, Health Grants Administration.

To prevent the relapse of arrested tuberculosis with a consequent need for repeated hospitalization, rehabilitation measures are recognized as an indispensable part of any adequate tuberculosis program. Such services have also been expanded. Research into preventive and therapeutic techniques has been encouraged under the grant; studies of the preparation and use of B.C.G. vaccine have been especially significant.

As indicated in Table 3, 42 percent of all monies expended in Canada were used to provide staff, equipment and rehabilitation services for sanatoria; 13.4 percent purchased streptomycin and other drugs; 35.7 percent were utilized for diagnostic and case-finding services including mass x-ray units, routine hospital admission x-rays and diagnostic clinics; 3.7 percent were expended to train physicians, nurses and technicians, while 3.1 percent provided the various B.C.G. vaccination programs and 1.9 percent financed research.(1)

The nature of the projects has varied widely depending on the needs of a particular province at the time of the initial grant. As shown in Table 3, Alberta allocated 82 percent of its share to sanatoria, while Ontario used only 18.4 percent for this purpose.(2) Nova Scotia spent 19.8 percent for diagnosis and case-finding while Manitoba utilized 60.7 percent on similar work. Quebec spend 6.7 percent for B.C.G. vaccination while six provinces used nothing for this type of activity.

In addition to the Tuberculosis Control Grant, federal authorities have assisted the provinces with the construction of sanatoria. Table 4 indicates that during the first six years of the National Health Program, $4,761,000 of Hospital Construction Grant funds assisted in adding 5,000 beds to the existing accommodation for tuberculosis patients.

---

(1) In addition to expenditures under the Tuberculosis Control Grant, Quebec spent roughly $450,000 out of its share of the Public Health Grant for B.C.G. vaccination programs, bringing the total expenditures on vaccination to over $1,100,000 for the six year period. Approximately $40,000, derived from funds available under other grants to Quebec, Saskatchewan and Nova Scotia, were spent on research into tuberculosis problems.

(2) Alberta spent most of this money to provide free sanatorium treatment for patients with non-pulmonary tuberculosis.

TABLE 3. EXPENDITURES UNDER THE TUBERCULOSIS CONTROL GRANT: MONIES SPENT ON TYPE OF PROGRAM AS A PERCENTAGE OF TOTAL, FISCAL YEARS 1948-49 TO 1953-54 INCLUSIVE

Type of Program	Nfld	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	Ten Provinces
Sanatoria[a]	58.9	31.3	62.9	54.3	46.5	18.4	26.7	25.6	81.5	33.6	42.0
Drugs	19.5	11.5	17.3	11.4	9.5	22.9	11.2	12.3	7.4	14.2	13.4
Diagnosis and Case-finding	15.3	55.7	19.8	33.4	29.1	52.2	60.7	53.8	9.1	46.3	35.7
B.C.G. Vaccination	3.9	-	-	-	6.2	-	0.3	5.0	-	-	3.1
Training of Personnel[b]	2.4	1.5	-	0.9	6.5	0.4	1.1	2.1	1.8	5.3	3.7
Research	-	-	-	-	2.2	6.1	-	1.2	-	0.6	2.1

(a) Program includes purchase of equipment, staff salaries and rehabilitation services.
(b) Program includes the training of physicians, nurses and technicians.

Source: Dept. N.H.& W., Research Division based on data from Directorate of Health Services, Health Grants Administration.

TABLE 4. EXPENDITURES UNDER THE HOSPITAL CONSTRUCTION GRANT: NUMBER OF BEDS APPROVED AND AMOUNTS EXPENDED, BY PROVINCE, FISCAL YEARS 1948-49 TO 1953-54 INCLUSIVE

Province	Number of Patient Beds in Sanatoria	Number of Beds for Sanatoria Nurses	Number of Beds for Tuberculous Patients in Mental Institutions	Amounts Expended in $ Thousand
Newfoundland	386	12	-	309
Prince Edward Island	-	-	-	-
Nova Scotia	200	-	-	22
New Brunswick	125	94	-	174
Quebec	2,208	-	-	2,278
Ontario	619	123	-	995
Manitoba	18	15	-	23
Saskatchewan	-	-	-	-
Alberta	488	-	264	278
British Columbia	264	-	581	682
Ten Provinces	4,308	244	845	4,761

Source: Dept. N.H.& W., Directorate of Health Services, Health Grants Administration.

VOLUNTARY AGENCIES

Since the Canadian Tuberculosis Association was founded in 1900, voluntary work in this field has continued to grow. The objectives of volunteer work have changed from time to time, however. In early times most of the activities aimed at providing treatment; today treatment has been taken over by public agencies and volunteer effort is concentrated on case-finding, diagnostic, rehabilitation and educational work. Although federal and provincial governments have assumed much of the cost of control programs, nevertheless there is still ample scope for volunteer work in fields where provincial services have not yet been developed.(1) Moreover, it is the volunteer groups that develop and maintain the public support so indispensable to any service, whether official or non-official.

The Canadian Tuberculosis Association has branches in all provinces and most of these maintain local Christmas Seal committees. Although the national executive coordinates the services of all member units and offers consultation, local branches have a considerable degree of autonomy. The Association is financed through funds derived from the sale of Christmas Seals, amounting now to nearly $2,000,000 annually.(2) The federal government assists with an annual grant of $20,000 and the Canadian Life Insurance Officers Association also contributes.

The Association's executive division is located in Ottawa, serving in a consultative capacity to various federal agencies including the Departments of National Health and Welfare and Veterans Affairs, the Dominion Bureau of Statistics, the Canadian Pensions Commission and the Defence Medical Services and as a distribution centre for educational literature and films. The Association is a member of the International Union against Tuberculosis(3) and of the Commonwealth Conference of Tuberculous Workers.

---

(1) Provincial tuberculosis associations have pioneered in many areas which are now operated by provincial governments - for example, in initiating mass x ray surveys and rehabilitation services. In some provinces this work is still a function of volunteer groups.

(2) Canadian Tuberculosis Association, Annual Report, 1948 to 1953. Receipts from the sale of Christmas Seals have risen from $1.49 million in 1948 to $1.95 million in 1953.

(3) This body is affiliated with the World Health Organization; the Canadian Tuberculosis Association contributes to its budget.

Through the cooperation of the National Association for the Prevention of Tuberculosis in England, exchange scholarships have been established and several Canadians, aided by federal bursaries, have studied there.

The contributions of voluntary agencies far exceed their financial outlays. Most of the organizational work needed for mass x-ray surveys is carried out at a local level by volunteers; so is the job of sending Christmas Seals and educational literature to 2,000,000 Canadian homes each year. In Saskatchewan, Manitoba, Ontario and Quebec, voluntary associations also operate government financed treatment services.(1)

PROVINCIAL TUBERCULOSIS PROGRAMS

ADMINISTRATION. The administration of tuberculosis control programs varies widely across Canada. Both government and voluntary agencies are involved in all provinces but some rely more on public agencies and others on volunteer groups.

In Saskatchewan and Manitoba voluntary organizations act as official representatives of the provincial governments and administer all types of anti-tuberculosis services ranging from case-finding and therapy to the sale of Christmas Seals. Each of the six provinces - Prince Edward Island, New Brunswick, Quebec, Ontario, Alberta and British Columbia - maintains a separate Division of Tuberculosis Control as a part of its health department. These divisions coordinate all control activities and cooperate closely with the provincial branches of the Canadian Tuberculosis Association. In each province the Director of Tuberculosis Control administers all treatment services and generally, the diagnostic clinics. The Prince Edward Island, Ontario and British Columbia divisions are also responsible for the rehabilitation of tuberculous patients. In New Brunswick this function is discharged jointly by the division and the provincial Tuberculosis Association, while in Alberta it is assumed entirely by the Alberta Tuberculosis Association. In all six provinces, mass x-ray surveys are a joint responsibility of the public and voluntary agencies.

(1) Further information concerning the work of provincial tuberculosis associations is given in subsequent detailed sections on specific provincial programs.

Newfoundland and Nova Scotia have no separate provincial divisions charged with tuberculosis control. In Newfoundland, the Deputy Minister of Health administers the sanatoria and diagnostic clinics and cooperates with the Newfoundland Tuberculosis Association in providing mass x-ray and rehabilitation services. In Nova Scotia, this work is a part of the general public health program operated by the provincial Department of Public Health. The Deputy Minister of Public Health, head of the Hospital Division, also controls the provincial sanatoria and coordinates the work of the divisional medical health officers who provide diagnostic services. Rehabilitation work and mass x-rays are organized jointly by the provincial government and the Nova Scotia Tuberculosis Association.

In some provinces, the larger cities maintain their own divisions of tuberculosis control, responsible for operating sanatoria, diagnostic clinics, mass x-ray units and other preventive and educational services. The work of these municipal organizations is described in subsequent sections on individual provinces.

In all provinces except Quebec and Newfoundland, medical health officers can obtain legal power to examine cases of suspected tuberculosis and to commit active cases to sanatoria. Within the sanatoria, patients may also be segregated on detention wards if their conduct warrants it.

CASE-FINDING AND DIAGNOSIS. Because the onset of tuberculosis is characteristically slow and insidious, people in the early stages of the disease are usually unaware that they are ill or that they may infect others.(1) The first task of any control program is therefore to discover suspected cases at an early stage and to arrange for their diagnosis and treatment.

Case-finding. The chief technique used to discover cases of tuberculosis in the general population is the mass x-ray. Mass x-ray programs are designed only to uncover cases, however, and their success depends on the efficiency of "follow-up" diagnostic services, especially the diagnostic clinic.(2) Two services are available for mass screening: x-ray surveys at a community level and routine x-ray examinations of all hospital admissions and outpatients.

---

(1) Anderson, R.J. "Essentials of Tuberculosis Control Administration". Medical Papers of the Canadian Tuberculosis Association, 1951, 46.

(2) Mass x-rays have also been useful in exposing other unsuspected thoracic abnormalities.

Community mass x-ray programs became feasible with the development of photofluorographic equipment capable of taking large numbers of low-cost chest plates quickly and of installation in motor vehicles to service isolated areas. All provinces maintain some form of free mass x-ray service. Provincial tuberculosis associations have long been active in this work, raising funds for purchasing mobile units and for employing organizational staffs; provincial governments, either directly or with federal aid, provide operating personnel, films and film reading services. Since x-ray units are now installed in buses, railway cars, aircraft and boats, few geographic areas are beyond reach. As shown in Table 5, over 2,000,000 persons were x-rayed by mobile units in 1953 alone and over 11,000,000 since 1948.

As other types of x-ray services have expanded, there has been a tendency to question the value of mass surveys. In some provinces investigations have revealed that this form of case-finding is as efficient as any, however, and that a high proportion of cases discovered in this way have been located at a very early stage of infection.(1) Recently, the work of mass surveys has tended to be concentrated in areas and among groups where the incidence of tuberculosis is believed to be high. These include isolated Indian and Metis settlements, lumber camps, industrial workers, hard rock miners, patients in mental institutions, medical and nursing students and high school and university populations.(2)

As Table 5 indicates, routine x-rays of hospital admissions has expanded rapidly since 1948. Not only is the incidence of tuberculosis greater in this group than in the general population but the method also brings the medical profession and hospital personnel directly into anti-tuberculosis work.(3)

(1) Canadian Tuberculosis Association, Annual Report, 1952, 24 and 86.
(2) Further information regarding the number of cases located through mass surveys may be found in the D.B.S. publication, Tuberculosis Statistics.
(3) Canadian Tuberculosis Association, Annual Report, 1949, 20.

TABLE 5. ANTI-TUBERCULOSIS ACTIVITIES IN CANADA: BY CALENDAR YEAR, 1948 TO 1953

Calendar Year	X-rays taken by Mass Survey Units (thousands)	X-rays taken in General Hospitals (thousands)	B.C.G. Vaccinations (thousands)
1948	1,610(a)	(b)	(b)
1949	1,750(a)	(b)	(b)
1950	1,890	310(c)	80
1951	2,040	440(c)	120
1952	1,930	490(c)	130
1953	2,010	560(c)	130

(a) Figures exclude Newfoundland, for which no data are available.
(b) No data are available.
(c) Figures exclude Prince Edward Island and Quebec, for which no data are available.

Sources: D.B.S. Tuberculosis Institutions, 1948 to 1952.
D.B.S. Tuberculosis Statistics, 1953.

In recent years an increasing number of hospitals has installed x-ray equipment for routine tests. In all provinces except Prince Edward Island and Alberta, both equipment and operating costs have been provided through federal funds; in Alberta, the provincial Tuberculosis Association has assumed full responsibility for financing the program. Special photofluorographic equipment has been installed in large institutions while the smaller hospitals receive cash payments to cover the cost of taking admission x-rays with their standard apparatus. During the past ten years, the construction of hospitals in remote areas has given the more isolated populations access to similar facilities.

The expansion of screening services has reduced the need for tuberculin testing in case-finding programs. Patch tests are usually administered to children under the age of 12; negative reactors may be vaccinated with B.C.G., while positive reactors undergo further examination. The provinces of Newfoundland, Quebec and Saskatchewan operate a general B.C.G. vaccination program.(1) In all other provinces vaccine is generally administered on request to individuals who respond negatively to tuberculin tests or to persons such as medical students, nurses-in-training or hospital employees who are in direct contact with the disease.

Diagnosis. The central agency of official diagnostic programs is the clinic. Despite the extension of mass x-ray surveys and routine admission examinations, a greater proportion of active tuberculosis cases are diagnosed by clinics than by any other agency. The past six years have witnessed a substantial growth of free services and at the present time (1954) all provinces provide some type of free program.

Most important of the diagnostic services is the stationary clinic with its medical, nursing and technical specialists, its well-equipped x-ray and analytical laboratories and, in some instances, its observation ward. Such clinics are situated either in the larger cities or are attached to sanatoria and serve cases sent from outlying points as well as their own immediate vicinities.

For areas inaccessible to major clinics, diagnostic services are provided by various methods. Quebec, Nova Scotia and New Brunswick maintain physicians, specialized in

(1) As indicated in an earlier section, B.C.G. vaccination is also used for Indians anywhere in Canada. For a detailed account of B.C.G. vaccination programs in Canada, see Notes on B.C.G., published in 1951 by the Institute of Microbiology and Hygiene, University of Montreal.

tuberculosis work, who serve in the local health districts.[1] These resident specialists are provided with x-ray equipment but usually depend on sanatoria for other diagnostic facilities. In Saskatchewan, staff of the Saskatchewan Tuberculosis Association held monthly clinics at general hospitals throughout the province. Travelling diagnostic clinics are maintained by Newfoundland, Prince Edward Island, Ontario, Manitoba, Alberta and British Columbia. Some are staffed by physicians and nurses, others by nurses and technicians; many are attached to provincial sanatoria. In areas lacking resident specialists and visiting clinics, people have standard sized chest plates made at the nearest hospital which sends them to a provincial clinic for diagnosis.

Clinics do not limit themselves to diagnosis, however. Nearly all maintain follow-up services to search out contacts, to conduct routine re-examinations of ex-patients and to supervise home care for non-hospitalized patients.

Case Registers. To obtain some estimate of the nature and extent of disease, all provinces have established tuberculosis case registers. These record the number of cases, the types of disease, whether active or arrested, the nature of care received and the location of the patient. Usually the registers also contain the names of contacts and the steps taken to examine them. Since tuberculosis is a reportable disease in all provinces, the registers of active cases are usually complete.

Central case registers are maintained by the health departments of Newfoundland, Prince Edward Island, New Brunswick, Manitoba, Saskatchewan, Alberta and British Columbia.[2] Divisional medical health officers maintain their own registers in New Brunswick and Nova Scotia, while in Ontario the local boards of health are responsible for keeping a register and reporting cases to the provincial department. Wherever municipalities have Divisions of Tuberculosis Control, there is usually a municipal register. The Manitoba Department of Health also keeps a record of all tuberculous Indians resident in the area between James Bay and the Saskatchewan boundary.

---

(1) In Nova Scotia and New Brunswick, District Medical Health Officers who carry on this work are given specialist training in diagnostic procedures.

(2) New foundland maintains a case register in both the eastern and western parts of the province. Saskatchewan, too, has a regional register.

TREATMENT. At the end of World War II, long waiting lists coupled with the increasing number of tuberculosis cases discovered by improved diagnostic measures emphasized the need for more accommodation in sanatoria. Since that time all provinces have increased institutional capacities. According to Table 6, tuberculosis institutions had 18,977 beds in 1953 - an increase of 35 percent over the 1946 figure.(1) A substantial part of the new accommodation has been built in areas, such as Newfoundland and Quebec, where the incidence of this disease exceeded the Canadian average at that time.

As indicated in Table 7, 96 tuberculosis institutions were in operation in Canada in 1953. Of these, 66 were sanatoria and the other 30, special units in general hospitals. The rated bed capacity of the sanatoria was reported to be 17,121 but 17,237 beds were actually set up. Beds set up expressed as a percentage of bed capacity was 101, indicating no overcrowding in these institutions. There is every indication that the problem of providing accommodation for tuberculosis patients has been largely solved.(2) However, new beds may be needed in the future to meet the needs of the growing population and to replace obsolete buildings.

Sanatoria facilities are administered largely by provincial health departments in Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Alberta and British Columbia; by provincial anti-tuberculosis associations in Manitoba and Saskatchewan; and by local or religious voluntary groups in Ontario and Quebec. In addition, all provinces except Prince Edward Island, Manitoba and Alberta have special tuberculosis units in various types of hospitals, supported mainly by voluntary organizations, but supervised by provincial authorities. In some provinces, adult cases of non-pulmonary tuberculosis may be admitted to general hospitals, because of their need for specialized surgery and other therapies.

Treatment of pulmonary tuberculosis is free to all residents in Newfoundland, New Brunswick, Nova Scotia, Manitoba, Saskatchewan and Alberta. In the other four provinces patients who are able to pay may be required to do so, but most cases receive free therapy.(3) Treatment for non-pulmonary tuberculosis is free in four provinces - New Brunswick, Manitoba, Saskatchewan and Alberta; in others, patients may be required to meet the cost.

---

(1) This figure does not include beds for tuberculous patients in mental institutions; in 1953, such beds totalled 2,289.

(2) Canadian Tuberculosis Association, Annual Report, 1953, 22. Reports from the provincial health departments, relating to 1953 conditions, indicated that sufficient accommodation was then available in Prince Edward Island, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

(3) See section "The Cost of Tuberculosis Programs".

TABLE 6. NUMBER OF BEDS IN TUBERCULOSIS INSTITUTIONS: BY PROVINCE AND CALENDAR YEAR, 1946 TO 1953[a]

Province	1946	1947	1948	1949	1950	1951	1952	1953
Newfoundland	430	433	433	435	435	784	788	785
Prince Edward Island	140	145	145	150	150	166	150	150
Nova Scotia	1,131	1,141	874	1,011	1,221	1,204	1,205	1,198
New Brunswick	758	958	913	926	908	1,004	1,016	1,025
Quebec	4,055	4,044	4,045	4,534	5,767	5,903	5,789	5,915
Ontario	3,999	4,023	4,308	4,262	4,476	4,480	4,412	4,577
Manitoba	938	1,153	1,253	1,259	1,287	1,294	1,279	1,263
Saskatchewan	851	803	871	883	883	881	828	867
Alberta	797	787	751	1,008	940	976	1,088	1,180
British Columbia	925	1,301	1,352	1,316	1,433	1,411	1,583	1,588
Yukon and Northwest Territories	(b)	(b)	(b)	(b)	239	304	363	429
Canada	14,024	14,788	14,945	15,784	17,737	18,407	18,501	18,977

(a) Figures do not include beds for tuberculosis patients in mental institutions.
(b) Data not available.

Sources: D.B.S. Tuberculosis Institutions, 1946 to 1952
Nfld. Dept. P.H.& W., Annual Report, 1946 to 1950.
D.B.S. Tuberculosis Statistics, 1953.

TABLE 7. TUBERCULOSIS INSTITUTIONS IN CANADA: BY TYPE OF INSTITUTION AND BED CAPACITY, DECEMBER 31, 1953.

Province	Tuberculosis Sanatoria				Tuberculosis Units	
	Number of Sanatoria	Rated Bed Capacity	Beds Set Up	Beds Set Up as a Percentage of Rated Bed Capacity	Number of Units	Beds Set Up
Nfld.	2	622	693	111	2	92
P.E.I.	1	150	150	100	-	-
N.S.	5	866	848	98	6	350
N.B.	5	867	931	107	1	94
Que.	18	5,547	5,488	99	7	427
Ont.	17	4,381	4,451	102	2	126
Man.	7	1,268	1,263	99	-	-
Sask.	3	803	803	100	2	64
Alta.	3	1,180	1,180	100	-	-
B.C.	5	1,437	1,430	99	3	158
N.W.T. and Yukon	-	-	-	-	7	429
Canada	66	17,121	17,237	101	30	1,740

Source: D.B.S. Tuberculosis Statistics, 1953, 13-15, Tables 4 and 5.

Until a few years ago sanatoria patients were given a rcutine treatment of bed rest and special diet or collapse therapy such as pneumothorax. With the advent of antibiotics, more modern surgical procedures have become possible Federal grants have facilitated the rapid adoption of such innovations. Since 1948, well over $2,200,000 have been spent for streptomycin and other drugs while additional large sums have permitted an expansion of services. Well-equipped surgical units have been established in sanatoria; surgeons and other specialist staff have been employed. A shortage of surgical facilities still exists but the deficit is being rapidly overcome. As a result of these changes, outpatient pneumothorax services have declined and although all provinces continue to operate some form of refill centre, its role is steadily diminishing in importance.

The expansion of treatment facilities in tuberculosis institutions has been accompanied by an increase in the numbers of medical and technical personnel. The immediate postwar period was marked by a shortage of skilled staff in all provinces; however, higher salaries, expanded training programs and public grants for employing specialists have resulted in reasonably adequate staffs in most sanatoria. Public funds have also been used to provide graduate training for existing medical staffs and the sanatoria have helped themselves by organizing specialized training for nursing students and aides.

REHABILITATION AND WELFARE. All provinces maintain rehabilitation services, varying in type and extent. The Divisions of Tuberculosis Control in British Columbia, Ontario and Prince Edward Island employ full-time directors of rehabilitation. In Manitoba, Alberta, New Brunswick, Nova Scotia and Newfoundland, where rehabilitation is a joint responsibility of the province and the voluntary tuberculosis associations, full-time directors are paid out of Christmas Seal funds. The medical directors of the sanatoria provide rehabilitation services for inpatients in Saskatchewan and Quebec.

Programs for inpatients include academic courses for both school age children and adults as well as vocational guidance and training. Ex-patient training and job placement services are being expanded through the federal-provincial programs for disabled persons and the Special Placements Section of the National Employment Service. The Canadian Tuberculosis Association is represented on the National Advisory Council on Rehabilitation established by Order-in-Council in 1951.(1)

(1) The Canadian Tuberculosis Association also organized an annual meeting of all rehabilitation officers employed in the sanatoria of all provinces.

Families whose breadwinners are hospitalized receive some form of financial assistance under the Mothers' Allowance Act in all provinces except Alberta.(1) In some provinces patients convalescing at home or awaiting admission to sanatoria as well as ex-patients taking vocational courses may receive some form of allowance until they become self-sustaining.

PUBLIC EDUCATION. In tuberculosis as in other fields of health, medical personnel perform educational work along with other duties. Organized public education, however, is a function of the tuberculosis associations which often employ full-time personnel for this work. The usual media include literature, radio, press, films and lectures. Mass x-ray surveys and Christmas Seal campaigns are accompanied by widespread publicity concerning the merits of screening services and the role of the public in tuberculosis control. Local service clubs perform valuable services in this connection.

RESEARCH. The developing program of tuberculosis control and the recent public interest in all health research have combined to stimulate investigations into problems related to this disease. Grants-in-aid of such study have been used by Ontario and Quebec and especially by the larger institutions such as the Lavoisier Institute and the Institute of Microbiology and Hygiene, both in Montreal, and Connaught Laboratories in Toronto.

BOVINE TUBERCULOSIS CONTROL. The federal Department of Agriculture's Health of Animals branch is responsible for the control of bovine tuberculosis. Various programs are in operation for inspecting cattle and destroying infected animals. Roughly 75 percent of all cattle in Canada are now tested and the incidence of disease discovered through government inspection is declining yearly.(2) Owners are compensated for slaughtered animals.

In addition to testing cattle, the custom of pasteurizing milk has doubtless reduced the probability of transferring the disease to humans. In 1952, over 80 percent of all milk marketed in Canada was pasteurized and in some provinces as much as 99 percent.

---

(1) In Alberta the municipalities assist needy mothers.
(2) Dept. of Agriculture, Annual Report, 1952-53, 89.

CONTROL PROGRAMS, BY PROVINCE

NEWFOUNDLAND. Tuberculosis has been Newfoundland's main physical health problem for many years. In 1945, investigation revealed that the death rate from this cause in St. John's was more than three times as high as the corresponding rate for Canada.(1) Despite a substantial decline in deaths, in 1953 the rate was still more than twice as high as for Canada as a whole. In part, this high mortality results from the difficulty of providing accessible control services. Almost half of Newfoundland's population lives outside the Avalon Peninsula in small settlements of 50 to 300 persons, scattered along a six thousand mile coastline. Consequently, until recently the isolation of the average outport raised the cost of hospital and clinic supplies to a prohibitive level; in late years, however, a comprehensive control program has been established.

An anti-tuberculosis society, the Association for the Prevention of Consumption, was organized in Newfoundland as early as 1906. Further interest was evidenced in 1910 when the Imperial Order Daughters of the Empire opened the Mundy Pond Camp with six beds for women with pulmonary tuberculosis. Government participation began in 1912 when a Tuberculosis Public Service was initiated. This Service took over control of the existing sanatorium, expanding its facilities at the time of World War I. Educational activities at that time, however, were largely associated with summer tours of the sanatorium superintendent and two nurses to the outports.

During the depression years of the early 1930's, preventive measures lapsed. In 1936, an outpatient clinic was established in the sanatorium at St. John's to serve the local population. Two years later the Avalon Health Unit was organized in the Harbour Grace area. The unit provided a mobile clinic for the peninsula, combining mass x-ray and dispensary services.(2) It was transferred to St. John's in 1947 and reorganized under the name of the Tuberculosis Dispensary to provide a central diagnostic and treatment centre for that area and to coordinate tuberculosis control activities throughout the island.(3)

(1) D.B.S. Tuberculosis Statistics, 1953, 132-133, and Nfld. Dept. of Health, Report on the Births, Marriages and Deaths in the Province of Newfoundland for the Year 1952. St. John's, Queen's Printer, 1954.

(2) Despite its name, the Avalon Health Unit was concerned only with tuberculosis control and should not be confused with health units in other provinces.

(3) Although the St. John's unit was called a "dispensary", it functions as a diagnostic and treatment clinic and is not a dispensary in the ordinary usage of the word.

Although the St. John's Sanatorium had been modernized and enlarged during this interval, accommodation continued to be inadequate and in 1945 the government took over the Canadian Naval Hospital located beside the sanatorium, converting it for tuberculosis cases.(1) Construction of a new hospital at Corner Brook, designed to care for west coast residents, was completed in 1951. Thus, from 1944 to 1953, accommodation for tuberculous patients was increased from roughly 200 to 785 beds. In addition, 60 beds for patients with non-pulmonary tuberculosis have since been made available in the St. John's General Hospital and a new 50 bed unit is under construction (1953) at the St. Anthony Hospital.

During this period, too, the St. John's Rotary Club became instrumental in organizing the Newfoundland Tuberculosis Association (1944) to further a preventive program of case-finding and public health education. To provide diagnostic services to the outports, the association acquired a variety of mobile x-ray units including a motor vessel, "Christmas Seal". A rehabilitation service for ex-patients was initiated in 1949. In 1951, it appointed a special committee to investigate the extent of bovine tuberculosis and, as a result, arrangements have now been made to inspect all cattle and to destroy infected animals.

For the northern part of the province, diagnostic and therapeutic facilities have been developed by the International Grenfell Association and the Notre Dame Bay Memorial Hospital Association.(2)

Today, Newfoundland's tuberculosis control program is administered by the health department which cooperates with voluntary associations. The Deputy Minister of Health supervises the two provincial sanatoria as well as the prevention programs directed by the Tuberculosis Dispensary for the eastern part of Newfoundland and by the outpatient department of the West Coast Sanatorium for the western part.

Case-finding and Diagnosis. Stationary diagnostic clinics and case registers are maintained by both the Tuberculosis Dispensary and the West Coast Sanatorium.(3) Limited diagnostic services are also provided by most general hospitals.

---

(1) Nfld. Report of the Health Survey Committee, 1955.
(2) Nfld. Preliminary report of the Health Survey Committee, 1950, 43.
(3) The case register maintained by the Dispensary covers the eastern and southeastern part of the province from Bonavista Bay to the Burin Peninsula while the West Coast Sanatorium register includes the remainder of Newfoundland.

At St. John's, free diagnostic clinics are held daily for patients referred by private physicians and for suspected cases and contacts. Both clinical and x-ray examinations are available to all suspects and mass x-ray surveys are conducted for special groups. A mobile x-ray team convenes clinics at Harbour Grace every second month. Staff nurses visit the homes of contacts to advise on home care and essential precautions for active cases pending admission. Similar diagnostic and public health services are provided by the West Coast Sanatorium.

Most of the general hospitals (including the cottage hospitals) have stationary x-ray equipment.(1) The standard chest plates are sent for interpretation either to the Dispensary or the West Coast Sanatorium. District public health nurses attempt to trace contacts and visit patients at home but have little time for such work. The two general hospitals at Twillingate and St. Anthony have more extensive facilities. In addition to the stationary x-ray apparatus, they also maintain mobile x-ray units and specialist staff for clinical examination of patients from the Notre Dame Bay area and the northern part of the island. Although operated independently, they receive financial assistance from the province in return for diagnostic and limited survey work.

The B.C.G. vaccination program which until 1950 had been restricted to the St. John's area has been extended to include the entire province. Vaccination is limited to special groups such as school children, contacts of tuberculous patients, student nurses and the newborn babies of tuberculous mothers.(2)

The Newfoundland Tuberculosis Association cooperates closely with the province, especially in determining survey policies. The provincial Department of Health supplies films for x-ray work and the Association employs a physician who reads some plates; others are sent to St. John's or Corner Brook. Several mobile units including a railway coach, a bus and a motor vessel serve outlying districts. The motor vessel's medical team

(1) Prior to 1949 when Newfoundland became a Canadian province, the Newfoundland Tuberculosis Association made grants from its Christmas Seal funds to some cottage hospitals for x-ray equipment; since then, other cottage hospitals have been equipped and technicians trained with federal aid.

(2) Nfld. Annual Report of the Department of Health, 1953, 43.

consists of x-ray technicians and a nursing supervisor who gives tuberculin tests to school children, B.C.G. vaccination as indicated and instructs both children and adult groups in prevention.

Treatment. All tuberculosis cases in Newfoundland receive free therapy at the provincial hospitals. Since 1950, the costs of treatment and drugs at Twillingate and St. Anthony have also been paid through federal-provincial grants.

The shortage of treatment beds which existed for many years has been reduced. With the opening of the West Coast Sanatorium in 1951, the provision of beds for tuberculosis patients in the orthopaedic wing of the St. John's General Hospital and the new extension to the St. Anthony Hospital, Newfoundland will soon have the highest per capita bed ratio in Canada.(1)

General outpatient care is supplied by the departmental nursing service, private practitioners and medical officers at the dispensary while pneumothorax refill centres are located at strategic points throughout the island. However, the increasing accommodation in the sanatoria has reduced both the number of infectious cases cared for at home and the outpatient caseload.

Rehabilitation. As noted earlier, rehabilitation is a function of the Newfoundland Tuberculosis Association. In 1949 funds from the sale of Christmas Seals and federal grants permitted the employment of a rehabilitation officer to advise on the training of both in and outpatients and to expand the existing programs. Through the cooperation of the federal Department of Veterans Affairs, correspondence courses were arranged and by 1952 services had expanded sufficiently to justify the employment of a full-time director to plan a province-wide program. Full-time supervisors and teachers were hired and classrooms arranged for courses in watch repairing, shoemaking and other trades. Loans are available for rehabilitation purposes and a social worker looks after the welfare of discharged patients. Despite the difficulty of finding suitable jobs in an island where work is generally arduous, positions have been secured for many discharged patients.

(1) The new West Coast Sanatorium has 270 beds and the orthopaedic wing of the St. John's General, 60 beds. In 1953, a new 50 bed unit was under construction at the St. Anthony Hospital.

Public Education. Another of the functions of the Newfoundland Tuberculosis Association is public education. As in other provinces, the annual Christmas Seal campaign is accompanied by widespread publicity. A full-time health educator gives illustrated talks and distributes literature to school children, potential teachers and summer school students. A journal, "Northern Lights", is circulated to all doctors, nurses, clergy, teachers and other individuals who serve the public directly.

PRINCE EDWARD ISLAND. In Prince Edward Island provincial authorities have given more attention to tuberculosis than to any other disease. As early as 1926, the high morbidity and mortality rates led to the establishment of a Maritime Tuberculosis Educational Committee and to the appointment of a provincial diagnostician. Three years later this diagnostician became the chief of the Provincial Board of Health, a forerunner of the present Department of Health and Welfare. Following reorganization as a department, the provincial sanatorium was placed under the control of a Sanatorium Commission directly responsible to the Minister of Health and Welfare and its medical director became an assistant health officer, charged with tuberculosis control work.

When the National Health Program was introduced in 1948, the unit was raised to divisional status. The sanatorium's superintendent became director of the Division of Tuberculosis Control with headquarters in the hospital. In addition to administering the treatment branch and the newly formed preventive and field branch, he is responsible for all new admissions and for maintaining the provincial case register.

Case-finding and Diagnosis. Since 1949, diagnostic work has been supervised by a full-time medical director of chest clinics. These clinics serve in both a case-finding and diagnostic capacity. A person suspected of tuberculosis is sent to a chest clinic where x-rays, drugs and laboratory services are free to all patients referred by private physicians or mobile x-ray units. Prior to 1953, cases diagnosed as positive often received supervised home care; since that time they have been admitted to the sanatorium. When a new case is discovered or when patients are admitted or discharged, a public health nurse visits the home and, after routine tuberculin tests, refers all contacts to the clinic.

Clinic services have expanded greatly in recent years as more equipment and additional staff have become available.

At the present time (1954) clinics convene at Charlottetown twice a week, at Summerside twice a month and at three other centres once a month during the April to December period. The Charlottetown clinic is staffed by departmental nurses; in all other centres, the public health nurse assists with chest clinics.

Other case-finding programs are conducted by the Prince Edward Island Tuberculosis League which works in close co-operation with provincial authorities. Mass x-ray surveys cover most of the province biennially. In 1945, the League purchased a mobile x-ray unit and for the next few years its operation was financed from Christmas Seal funds, a provincial grant and a charge for individual chest plates; since 1948 services have been extended with funds from the Tuberculosis Control Grant.

Because of the small size of this province and its winter transportation problems, operation costs of mobile units have been relatively high. Moreover, as the coverage of the stationary chest clinics has increased, fewer cases have been discovered by the mobile teams. Nevertheless, new cases are still being found and many other abnormalities have also been revealed. Screening of special groups by this method has included teachers, R.C.A.F. personnel and some industrial employees.(1) The mobile unit sends films to the chest clinic at Charlottetown for final analyses.

The mobile unit visits the Falconwood (mental) Hospital and its associated Provincial Infirmary almost every year to screen both staff and patients and participates in community work. In 1952, two communities organized a combined x-ray, tuberculin test and B.C.G. vaccination project. Local citizens called on every home, explaining the project, and arranged clinics at schools with a mobile x-ray team in attendance. Apparently this type of project is successful for over 75 percent of the residents attended. All were x-rayed and those requiring further checks were given tuberculin tests and/or B.C.G. vaccine.

Other case-finding projects have included routine tuberculin tests for student nurses and sanatorium staff; B.C.G. vaccine is given when indicated.

---

(1) The Department of Education requires that all teachers be x-rayed once every two years.

Treatment. At the sanatorium, located in Charlottetown, therapy is free to all medical indigents. A substantial part of the maintenance costs of other patients is also paid by the province.(1) The sanatorium itself has 150 treatment beds and in 1951 a ten bed convalescent home was opened to care for patients unable to go home or with unsatisfactory home conditions. Because of the earlier bed shortage, in some instances treatment was begun either at home under the supervision of a chest clinic or in a general hospital(2); in other instances, patients had to be discharged prematurely. By 1953, however, the waiting list had been absorbed entirely.

Facilities, especially for surgery, have expanded rapidly in recent years and the sanatorium is now equipped and staffed to treat all forms of tuberculosis. Since 1951 it has purchased the part-time services of a chest physiotherapist and an orthopaedic surgeon from Halifax makes yearly visits.

In addition to the sanatorium, the province maintains three outpatient pneumothorax clinics whose services are free to all who need them.

Rehabilitation. In 1948, the Division of Tuberculosis Control engaged a full-time rehabilitation officer who became responsible for education and placement services. He interviews all sanatorium patients and gives aptitude tests. Academic or business training is made available through correspondence courses; vocational training is given to a few cases and occupational therapy to all. Children receive the usual type of elementary instruction. After investigation of home conditions by the rehabilition officer, patients who are heads of families may receive financial assistance.

Prince Edward Island's economy, based mainly on farming and fishing industries, makes it difficult to find suitable work for ex-patients. However, progress has been made and in 1952-53 employment was found for 24 persons.

Public Education. Apart from a few lectures to nurses, the province leaves most educational work to the voluntary tuberculosis association. Educational campaigns are conducted in conjunction with the mass x-ray surveys when

(1) In 1953, approximately 88 percent of the revenue of the sanatorium derived from the province and only 9 percent from patients.
(2) In 1950-51, 24 patients awaited admission to the sanatorium.

leaflets stressing the symptoms of incipient tuberculosis and the desirability of early detection are distributed in advance of the arrival of the mobile team. Publicity, including the use of films, is also associated with the Christmas Seal campaigns.

NOVA SCOTIA. To reduce tuberculosis morbidity and mortality, Nova Scotia's Department of Public Health initiated a control program in 1935. By 1940, divisional medical health officers had been detached to a number of points throughout the province to initiate local tuberculosis services along with other health programs. In most areas, these officers served as diagnosticians and consultants to private physicians in addition to maintaining their own case-finding services.

At the present time (1954) tuberculosis control for the province is a direct responsibility of the Department of Public Health. Its Deputy Minister who is also head of the Hospital Division controls the three provincial sanatoria and administers grants made to six tuberculosis units in general hospitals.(1) He is responsible, too, for the provincially operated mobile x-ray units, case-finding organization and integration of all services including the work of the medical health officers.

In the city of Halifax, the municipal Health Department operates its own control program and its own sanatorium. There, the medical superintendent of the sanatorium also serves as Director of Municipal Tuberculosis Control.

Case-finding and Diagnosis. The most significant diagnostic services are rendered by the divisional medical health officers and public health nurses, both specially trained in tuberculosis control techniques. Excluding Halifax - which has four diagnostic and ex-patient clinics and an additional clinic solely for ex-patients - the province has eight health divisions (districts), each serving from 45,000 to 80,000 residents Clinics convene weekly at divisional centres and twice a year in most other key communities Examinations are free for all suspected cases, contacts, ex-patients of sanatoria and others referred by a physician

Clinic work takes most of the health officer's time; each clinic requires four to five days for examinations and another two weeks to develop and read the chest plates

(1) The Director of Communicable Disease Control assists the Deputy Minister with the operation of the Hospital Section, Central Administration and the Mobile Chest X-ray Unit

and to compile reports. Every second week the divisional public health nurse spends some time in tracing and arranging examinations for contacts, visiting active cases who remain at home and maintaining clinical records.

The divisions fully utilize x-ray and other diagnostic facilities of the sanatoria and general hospitals(1); for work in isolated areas, they are equipped with portable x-ray machines. All suspicious cases discovered through mass surveys are referred to the divisions which are responsible for further diagnosis, for all admissions to sanatoria and for maintaining a case register. In their search for infection, the medical health officers and nurses visit schools, mental hospitals, homes for the aged and mills and factories where x-rays and tuberculin tests are conducted in cooperation with mobile teams and B.C.G. vaccine administered to special cases.

The provincial mobile x-ray unit is operated jointly by the department and the Nova Scotia Tuberculosis Association whose full-time director organizes surveys and arranges publicity. The remainder of the Association's staff is employed by the province rather than by the volunteer group per se; the Association financed the purchase of equipment, however.

The mobile unit, announced by a house to house canvass for appointments, operates throughout the province during the summer and in Halifax during the winter. Since roughly four and a half years are needed to cover the province, the first comprehensive survey was completed in 1953.(2) Fewer cases are revealed by this method than by the routine hospital admission tests or investigation of contacts; however, it is believed that at least one mobile unit is justified despite its high cost, since a large proportion of discovered cases are in an early stage of infection.(3)

---

(1) Chest plates are developed by the sanatoria but are read by the divisional medical health officers. The Rosemere Sanatorium provides diagnostic services for the Shelburne area and the Nova Scotia Sanatorium holds weekly outpatient clinics for the Kentville and Kings County areas.

(2) In 1951-52 the unit worked in rural areas lacking electricity or where no other x-ray facilities existed.

(3) The units miniature x-ray films are developed and read by the Nova Scotia Sanatorium. For surveying special groups, the stationary unit at the Halifax Tuberculosis Hospital is used.

The provincial department has actively promoted installation of miniature x-ray units in general hospitals for free routine examination of all admissions. Seventeen hospitals now have this equipment and arrangements have been made to reimburse others for tests carried out with their own standard apparatus. The Rosemere Sanatorium also takes routine x-rays of all patients admitted to its general hospital division.

Treatment. Treatment for pulmonary tuberculosis is free of charge to all residents of Nova Scotia; the cost is borne chiefly by the provincial government. Sanatoria and tuberculosis units in general hospitals are located at strategic points throughout the province.(1) In 1949, the Point Edward Sanatorium was constructed to serve patients from the Cape Breton area where substantial numbers of persons engaged in mining, iron and steel industries were especially susceptible to tuberculosis yet lacked a sanatorium. Accommodation has expanded steadily since 1945 so that by 1953 the waiting period for patients in need of bed care and chemo-therapy was reasonably short. However, the increased use of surgery has placed a heavy strain on the Nova Scotia Sanatorium - the only provincial hospital equipped for major operations - and in 1953, despite maximum use of available space, it reported a moderate waiting list.(2) The province hopes to replace an obsolete building with a new infirmary with sufficient room for all surgical cases. The Halifax Municipal Sanatorium, operated independent of the province, has its own surgery.

A surgical team from the Nova Scotia Sanatorium visits small tuberculosis units, performing minor operations and offering consultation, thus effectively reducing pressure on the home hospital by precluding admission for diagnosis only.

In addition to diagnostic and therapeutic work, the provincial sanatorium provides training for divisional medical health officers and public health nurses pending transferral to field units. It also gives a short two month course to affiliated nurses from Dalhousie University's School of Nursing and other hospitals, and a twelve month course to nursing aides

---

(1) In 1949, the cost of treatment units attached to general hospitals was met by a provincial grant of $3.26 per patient day. The Halifax Tuberculosis Hospital is largely maintained by the city but receives a provincial grant intended to defray a part of the operating costs.

(2) The majority of its patients have been transferred from other units for diagnostic and thoracic surgery. The units in general hospitals which were built in the 1930's provide only bed rest and simple forms of treatment.

Rehabilitation. Rehabilitation of tuberculosis patients is a joint responsibility of the province and the Nova Scotia Tuberculosis Association. The program is directed by a full-time Association staff member who supervises in-hospital services, maintains liaison with various organizations and oversees post-hospitalization work. In-hospital services are financed through federal-provincial funds while the cost of post-hospital work is paid by the voluntary agency.(1)

In-hospital services are being expanded rapidly. Workshops have been established and courses are provided in typing, sewing, shoemaking and barbering as well as in academic work. A Rehabilitation Advisory Board comprised of representatives of government, employers, labour and welfare assists the Association in this field.

Contingent upon a means test, the provincial Department of Welfare may grant a mothers' allowance to certain patients, covering the rehabilitation as well as the hospital period. For ex-patients, training may be arranged under the federal-provincial vocational training plan.

Public Education. As in other provinces, public education is associated with the mass surveys, Christmas Seal campaigns and rehabilitation program. Thousands of pamphlets are distributed yearly by the Nova Scotia Tuberculosis Association. Clinic personnel are also active in educational work.

NEW BRUNSWICK. Early in the 20th century New Brunswick initiated an anti-tuberculosis program, paying the municipalities a part of the cost of maintaining their patients in sanatoria. In 1940, the province paid a dollar per patient day while another dollar derived from a special tax on retailed tobacco. During the intervening period, the provision of diagnostic services had become one of the duties of the District Medical Health Officers who were qualified for tuberculosis control work.

At the close of World War II the province launched a drive to eradicate the disease and assumed the entire cost of sanatorium care for both pulmonary and non-pulmonary cases. Simultaneously the New Brunswick Tuberculosis Association was reorganized to supplement provincial work

(1) The Director of Rehabilitation supervises work in both the provincial sanatoria and the Halifax sanatorium. In 1952, staffs of these institutions included four rehabilitation supervisors, a part-time supervisor, an occupational therapist, two academic teachers, a crafts teacher, a commercial teacher and 20 to 25 part-time instructors.

through an extensive and intensive case-finding program. The entire program was coordinated in 1947 through the establishment of a provincial Division of Tuberculosis Control with headquarters in Saint John.(1) The Minister of Health, charged with the administration of all provincial hospitals, controls sanatoria while the divisional director plans and supervises the program, coordinates diagnostic, case-finding and treatment services and exercises general supervision over both official and voluntary agencies.

Case-finding and Diagnosis. Diagnostic clinics are provided in a number of centres throughout the province. In Saint John, the Saint John Tuberculosis Association is responsible for the operation of the clinic, while field staff of the provincial Department of Health convene clinics in other cities and towns. A senior clinician is employed by the provincial government to examine all films taken by mass x-ray units. He also provides consultation on chest films sent in by physicians and hospitals.

Field staff of the Division of Tuberculosis Control consists of provincial medical and nursing personnel working in the health districts and medical staff from the various sanatoria. In 1953, they convened clinics in ten centres, diagnosing suspected cases referred by private practitioners and giving treatment on an outpatient basis. X-ray and laboratory services as well as pneumothorax refills are free to patients.(2)

The New Brunswick Tuberculosis Association has always been active in organizing mass x-ray surveys. The first x-ray unit was purchased with Christmas Seal funds and the cost of organization, films and the salary of one technician came from the same source. Since then expenses have been taken over by the province, aided by federal grants, and the unit is operated jointly by the province and the voluntary agency which employs a full-time organizer to plan and publicize the work. Other unit personnel are paid by the province. The mobile unit visits rural areas during the summer and larger cities in winter, covering the entire province every two years. A special effort is made to x-ray all teachers, students over the age of 12 years and Indians.

In recent years there has been a tendency to concentrate survey work on groups or areas where the incidence

(1) The Saint John Tuberculosis Association provides accommodation for the provincial division.
(2) Prior to 1950, the New Brunswick Tuberculosis Association paid for x-rays of indigents unable to visit the provincial clinics.

of disease is high. In late 1951, for example, Queen's County reported an outbreak of infection affecting chiefly the high school population. The Division of Public Health Nursing in cooperation with the mobile x-ray unit conducted mass x-ray surveys and diagnostic clinics. The value of this work was demonstrated by the admission to sanatoria of 29 cases of active or suspected tuberculosis.

A program of screening all admissions to general hospitals, begun in 1949, has been extended and in 1953, 11 of the larger hospitals and a medical clinic had miniature x-ray units. The federal government pays 50 cents per film for interpretation.

The provincial health department supplies free vaccine for all who require B.C.G. vaccination. Up to 1952, this was used mainly for infants and children who responded negatively to tuberculin tests, and for institutional staffs.

Treatment. Treatment for both pulmonary and non-pulmonary tuberculosis is free to all sanatoria patients. Applications for admission are reviewed by the health department which assigns active cases to the various hospitals as beds become available. Pulmonary cases in need of surgery are sent to the Saint John Tuberculosis Hospital; orthopaedic cases are treated at Moncton. Surgical consultants visit other units to review cases for chest surgery.

In 1950, 120 to 140 cases of active tuberculosis awaited admission to sanatoria. The shortage of both beds and nursing staff was acute, especially at the Saint John hospital where the demand for surgical beds far exceeded supply. This situation changed quickly after 1951, however, when an 86 bed wing was added to the Notre-Dame de Lourdes Sanatorium and a new 33 bed wing to the Saint John Tuberculosis Hospital. At no time during 1953 was there an appreciable waiting list and at the close of the year roughly 30 beds were vacant.

Rehabilitation. Although academic subjects and handicrafts had been taught in New Brunswick before 1949, at that time two factors combined to expand the rehabilitation program. The New Brunswick Tuberculosis Association assumed responsibility for these services and placed them under a full-time director; federal grants made possible the provision of additional staff and better facilities. Since then all children have received school instruction, female patients learn homemaking and males may learn watch repairing or woodwork. Under direction of an occupational therapist, a number of patients produce articles which are sold through various outlets.

With the assistance of the provincial Department of Education and the federal-provincial vocational training plan, ex-patients may receive training in radio repair, automechanics, laboratory techniques and other trades. In all cases where a patient's former occupation may lead to a recurrence of the disease, the Director of Rehabilitation arranges training for suitable employment.

When the breadwinner of a family is hospitalized or convalescent, the province pays a maintenance allowance to his family. In March, 1953, 203 families were receiving payments under this regulation.

Public Education. Both the province and the New Brunswick Tuberculosis Association contribute to public education. The Association employs a public relations officer who distributes periodicals, posters and other literature and films provided by the Canadian Tuberculosis Association. Visits of mobile x-ray units are preceded by publicity and accompanied by talks to children.

QUEBEC. Quebec initiated a limited tuberculosis program over fifty years ago. Private anti-tuberculosis clinics were established in Montreal before World War I and in 1922, ten provincial dispensaries were set up in the province. In 1930 clinicians were provided with portable x-ray equipment to work in the provincial health units. Four years later the first clinic for administering B.C.G. vaccine to infants convened in Montreal.

Despite these activities, tuberculosis morbidity and mortality remained at a high level and in 1937 physicians and laymen organized a provincial committee for the prevention of the disease. Investigation revealed that sanatorium care as well as case-finding and follow-up techniques were inadequate. As a result of these findings, the committee launched a campaign of public education for doctors, laymen, teachers and students, while both the province and the city of Montreal determined ways and means of improving their programs.

Both the provincial and municipal health departments established Divisions of Tuberculosis Control (1938). New sanatoria were built to serve the Lake Saint John and Gaspé areas and later additional accommodation was provided in Montreal and Sherbrooke. Case-finding and diagnostic methods improved. In 1940, Montreal organized a municipal radiology clinic and two years later the city's Anti-Tuberculosis League purchased the first x-ray equipment

to be used for mass surveys of industrial groups.(1) The sanatorium at Mont-Joli began mass surveys of the Gaspé and Lower St. Lawrence areas in 1944.

Postwar years have been marked by an intensive anti-tuberculosis drive conducted by the province. In 1946, the Quebec Legislature voted $10,000,000 for the construction of sanatoria, intensification of case-finding and provision of free hospital care for indigent patients. An advisory committee, chaired by the newly appointed director of anti-tuberculosis services, undertook to implement the new programs. Since 1948 activities have again been expanded with federal aid.

Under the existing administration, the Minister and Deputy Minister of Health exercise general supervision over all anti-tuberculosis programs while the director of the Division of Tuberculosis Control coordinates government and voluntary activities. The director's responsibilities include maintenance of the provincial case register, supervision of medical directors of sanatoria, clinicians and anti-tuberculosis programs of the county health units. In Montreal and Quebec City case-finding and diagnostic services provided by voluntary organizations are also under the general supervision of the provincial division.

Case-finding and Diagnosis. Outside the major cities, case-finding and diagnostic programs are centres in the local health units and the several sanatoria. Clinicians attached to the health units, who are full-time provincial employees, perform fluoroscopic and x-ray examinations of all suspects and contacts referred by private physicians or x-ray survey teams. According to the report of the Quebec Health Survey Committee, 1948, the functions of clinicians appeared to be limited by a lack of adequate equipment and supervision and by the extent and nature of the territory they were required to cover.(2) Since that time the province has provided each sanatorium with a medical director who gives technical assistance to clinicians, thus permitting a more consistent follow-up of ex-patients, suspected cases and contacts.

Diagnostic facilities of the health units, too, have been extended through the provision of miniature x-ray units. The health units are now bringing people to the clinics, arranging visits by mobile x-ray teams and maintaining a rigid control over suspected cases. The sanatoria operate especially effective diagnostic clinics.

---

(1) Chest x-rays were made compulsory for all teachers in 1941.
(2) Quebec: Report of the Health Survey Committee, 1950, 8, 7-8.

In Montreal, case-finding is performed by staffs of the municipal Division of Tuberculosis Control, the Bruchesi Institute, the Royal Edward Laurentian (tuberculosis) Hospital and outpatient clinics of various other hospitals. The Laurier Clinic, maintained by the city, was initiated to assist private practitioners and to provide free chest x-rays for indigent suspects; subsidiary dispensaries have been opened in other parts of the city. The municipal division employs a number of public health nurses for home care under supervision of private physicians. These nurses trace contacts to ensure that they are x-rayed and investigate the socio-economic status of families where infection is found. The division also maintains a case register.

The privately operated Bruchesi Institute and the Royal Edward Laurentian Hospital serve the French and English populations of Greater Montreal. Until 1947 both obtained their operating revenues from provincial, municipal and private grants, patients' fees and Christmas Seal funds. At that time both institutions agreed with the province to waive Christmas Seal campaigns and fees in exchange for a government grant. The Montreal Anti-Tuberculosis League was given a monopoly over the sale of Christmas Seals to raise funds for mass surveys. Since 1949, a federal grant has covered the major operating costs of diagnostic services.

The Bruchesi Institute provides medical, social and hospital observation services and arranges admission to sanatoria. Its medical staff give complete free examinations and 15 full-time nurses supervise home treatment of active tuberculosis cases and check contacts. For patients in need of hospitalization for examination and observation purposes, the Institute maintains 50 beds. It also operates two clinics for preliminary examinations and a health camp for children with incipient tuberculosis.

The Royal Edward Laurentian Hospital makes similar services available to the English-speaking population. Beds are maintained for cases under observation and a large nursing staff gives home care, supervises the progress of ex-patients - often for several years - and assists with rehabilitation. Hospital staff also operates subsidiary clinics at Westmount, Verdun, Rosemount and Richmond Square.

The Quebec Anti-Tuberculosis League maintains a diagnostic clinic in Quebec City. Similar clinics are supported by voluntary tuberculosis associations in Sherbrooke and Lachine.

Both government and voluntary organizations provide free miniature chest x-ray services. Since 1938, the Provincial Committee for the Prevention of Tuberculosis has been active in mass x-ray survey work and makes every effort to ensure that all questionable cases receive clinical examinations.(1) Except in Montreal, the committee organizes all Christmas Seal campaigns to finance the publicity and conduct of community surveys in rural areas including the isolated mining and farming settlements in Northern Quebec and the Gaspe.(2) In the metropolitan area, the Montreal Anti-Tuberculosis League has its own mass x-ray survey unit which serves the city and health units in 21 surrounding counties. This is financed through public subscription. In Quebec City, the Quebec Anti-Tuberculosis League provides a similar service. Films are sent by all mobile units to sanatoria, dispensaries or tuberculosis clinics for interpretation.

In this province, routine chest x-raying of hospital admissions is increasing, especially in the larger institutions. Three Montreal hospitals now have miniature x-ray equipment. The use of B.C.G. vaccine is far more widespread in Quebec than elsewhere in Canada. A B.C.G. laboratory was established at the University of Montreal as early as 1926 to explore the effects of the vaccine; by 1938, the laboratory's work had expanded into several fields and it was given the now well-known name, the Institute of Microbiology and Hygiene.

With federal aid, in 1949 the province initiated a program of B.C.G. vaccination at all health units. Not only were newborn babies vaccinated, but also children, adolescents and adults who responded negatively to tuberculin tests. Certain large general hospitals in Montreal, Quebec and Three Rivers give routine B.C.G. vaccination to all children born in the institutions; dispensaries in Montreal and Quebec and the B.C.G. Clinic in Montreal also offer vaccine to all Mantoux negative people under their supervision.

As a precautionary measure, the vaccination of infants is supplemented by at least temporary home care for all children who may be exposed to tuberculosis. The B.C.G. Clinic also cares for infants who have been vaccinated at birth but cannot for various reasons receive proper postnatal care home. In 1952, the provincial government was

(1) This committee corresponds to the voluntary associations in other provinces.

(2) Although surveys are organized by the committee, the x-ray units themselves are operated by the province. The provincial department also provides mobile units for areas around Three Rivers, Roberval and Macamic.

planning a 100 bed hospital in Montreal for the postnatal care of infants whose homes were infected with tuberculosis. Offices of Le Placement Familial - a welfare agency with branches in Montreal, Three Rivers and Quebec City - place children exposed to active or potentially active tuberculosis in foster homes until they have built up resistance or until the source of infection has disappeared.

Treatment. Quebec sanatoria, owned and operated by lay or religious groups, are supervised by the Division of Tuberculosis Control. In 1946, construction was accelerated by the $10,000,000 grant of the Quebec Legislature.(1) The extension of case-finding services to outlying areas resulted in the discovery of many active cases in need of hospitalization. This in turn led to the construction of sanatoria in Northern Quebec, the Gaspe and Lower St. Lawrence areas. Although the construction of a new 500 bed hospital in 1950 improved accommodation to some extent in Montreal, nevertheless in 1953 sanatoria continued to be unable to admit all patients in need of treatment, especially in the larger urban centres.(2)

As mentioned earlier, new therapeutic techniques have greatly increased the demand for surgical beds. Surgical services have been extended at the Laval Hospital in Quebec City, the Royal Edward Laurentian in Montreal and the Hopital Sacre-Coeur at Cartierville. In 1950, a special surgical unit for tuberculous meningitis cases of all ages was established at the Alexandra Hospital in Montreal. Three mental hospitals maintain special units for their own tuberculosis patients.

Apart from the accommodation problem, the most important step toward reorganizing treatment services was the appointment of full-time medical directors to all sanatoria. These directors, responsible to the Minister of Health, provide a degree of coordination of admission, discharge and follow-up policies which was formerly lacking in the privately operated institutions of this province. In recent years additional staff and equipment have also been supplied with federal aid, especially in the hospitals constructed or enlarged since 1946.

(1) Since that date the province has made further substantial grants and the federal government has provided over $2,000,000, through its Hospital Construction Grant.

(2) Canadian Tuberculosis Association. "Report of the Quebec Committee for the Prevention of Tuberculosis" in Annual Report, 1953, 105.

The provincial government pays for surgery, treatment and pneumothorax refills for all medical indigents, except in Montreal. Rates depend on a sanatorium's classification which in turn depends on the scope of services rendered. Montreal pays for its own indigent patients. Free drugs are provided to all through the federal grant.

Rehabilitation. Quebec has no over-all rehabilitation program. In-sanatorium programs are being expanded, however, with federal-provincial aid. Patients have access to correspondence courses. The province's Department of Labour and the voluntary Association of the Cross of Lorraine cooperate to provide rehabilitation services for ex-patients; the Association also operates employment agencies in several cities.

Public Education. As in other provinces public education is a function of all clinicians and other medical personnel while organized programs are conducted by voluntary agencies. The Provincial Committee for the Prevention of Tuberculosis distributes literature, holds conferences in schools and industry and, in addition to adapting American films to French-speaking audiences, has prepared an original film "Sante et Bonheur". Among other educational media are radio programs and essay competitions for school and university students.

Research and Training. The Institute of Microbiology and Hygiene at the University of Montreal and the Lavosier Institute associated with St. Joseph's Sanatorium both conduct research into tuberculosis problems. The Institute of Microbiology and Hygiene has experimented with measuring the virulence of tubercle bacilli and with the effectiveness of B.C.G. vaccine. The Lavosier Institute investigates cardio-respiratory physiology.

For many years the Provincial Committee for the Prevention of Tuberculosis has encouraged the specialized training of medical personnel concerned with control of this disease. It compiles a bulletin, "Notes on Tuberculosis" which is circulated to all physicians and arranges graduate training for French-speaking practitioners at both Laval University and the University of Montreal. For English-speaking medical students and graduates, the Royal Edward Laurentian Hospital gives instruction in diagnostic and therapeutic techniques. It also plans to establish a training school for nurses, with specialization in post-operative care of surgical cases.

ONTARIO. Both government and voluntary organizations have long histories of anti-tuberculosis activities in Ontario. The National Sanatorium Association, founded in 1896, built one of the first sanatoria on the North American continent. In 1912, the Imperial Order Daughters of the Empire, took the first step toward specialized care for tuberculous children through the construction of a preventorium. During the depression years of the 1930's, provincial and federal governments cooperated in financing sanatoria construction as a relief measure and accommodation increased rapidly in consequence.

Since 1920 sanatoria have received a per diem grant for indigent patients; the province contributed 75 cents per patient-day and the patients' municipalities, $1.50. However, many municipalities continued to be reluctant to accept indigent patients and relatively few were able to pay their own maintenance. As a result, 50 percent of the patients for whom sanatorium care had been recommended by chest clinics failed to enter a sanatorium and 50 percent of mortality consisted of such cases. In 1938, the province assumed responsibility for the entire cost of indigent hospitalized cases.(1) Those able to pay in whole or in part were still required to do so. In return for this relief, municipalities were asked to provide for ex-patients unable to pay their own convalescent expenses; the province assumed responsibility for such cases from unorganized territory and for cases which had not established residence within a municipality. Since 1943, the province has paid approved physicians and clinics for pneumothorax refills for indigents.(2)

Christmas Seal campaigns had become a popular medium for soliciting public support of prevention programs. The voluntary associations operating sanatoria quickly realized the merits of popular subscription for financing diagnostic clinics and by 1945, 17 distinct organizations were conducting such campaigns. In conference with the Ontario Department of Health and the Canadian Tuberculosis Association,

(1) This excluded patients who were the responsibility of the Workmen's Compensation Board, the Department of Veterans Affairs and Indian Health Services.
(2) From 1938 to 1943, municipalities paid the physician or clinic and the province reimbursed the municipality. Since 1943 payments have been made directly to the source of treatment.

the groups agreed to establish a provincial Tuberculosis Association to coordinate the work of member agencies and promote voluntary work throughout the province. It was agreed, too, that campaign funds should be used primarily for diagnostic work such as mass surveys and the operation of chest clinics. This plan has succeeded so well that in 1954, 56 well organized county and district branches serve the entire province. Excepting voluntary organizations associated with sanatoria, all county and district agencies, acting under a formal constitution approved by the Ontario and the Canadian Tuberculosis Associations, now follow a standard campaign procedure.

The Ontario Tuberculosis Association's executive council is comprised of a representative from each county association, superintendents of all sanatoria, 11 members-at-large, the director of the provincial Division of Tuberculosis Control and the executive secretary of the Canadian Tuberculosis Association. This body elects a smaller Management Committee responsible for the actual conduct of the association's program in accordance with policies formulated by the council as a whole. The Association's head office is staffed by an executive director, two field secretaries and an office secretary. Arrangements have also been made to employ a qualified educational worker.

Through its Division of Tuberculosis Prevention, the health department administers the provincial control programs including the supervision of prevention, treatment and rehabilitation services. Sanatoria are administered under the Sanatoria for Consumptives Act. Physicians are legally required to report cases within 24 hours to the local medical officer who in turn reports to the department. Local authorities are responsible for ensuring that all cases are examined; if the suspect objects, both examination and treatment may be enforced by law. Local units are also expected to maintain case registers, encourage mass x-ray surveys and organize programs of public health education.

Case-finding and Diagnosis. The Ontario program is based on the work of the stationary and travelling chest clinics which have expanded steadily in recent years. In 1953, 265 clinics served 248 centres throughout the province. Clinic services are free except at seven clinics operated by general hospitals in Toronto; in these seven clinics, patients are expected to pay but no one has been refused admission because of inability to meet the cost of either the registration or the x-ray fee.

Local associations finance free routine chest x-rays in 210 centres, paying the full cost in 181 and a part of the cost in 29 clinics.(1)

The National Sanatorium Association operates a central clinic located in the Gage Institute, providing a complete free diagnostic service to all residents of metropolitan Toronto. Travelling teams from this clinic visit the York, Simcoe, Peel and Ontario counties. Muskoka and Parry Sound are served by similar teams from the Association's sanatorium at Muskoka.

As far as Ontario is concerned, there is no question of the importance of mass x-ray surveys to a comprehensive control program. Both the province and the Ontario Tuberculosis Association cooperate in providing free mobile x-ray services to all areas. The province maintains three mobile and three portable units, supplying the equipment, personnel and interpretation service while local associations finance organization costs, clerical staffs and canvassers and arrange with various community groups to direct the projects. In northern areas inaccessible by road, railway cars equipped with portable miniature x-ray machines were used in 1950 and again in 1953.

In the counties of York and Simcoe and in the districts of Parry Sound and Muskoka where the National Sanatorium Association conducts Christmas Seal campaigns, the Gage Institute operates and finances two mobile units and a portable unit. The Niagara Peninsula Sanatorium maintains a similar free mobile service for Haldimand, Lincoln and Welland Counties.

---

(1) On December 31, 1953, clinics were financed as follows:

Method	Number of Clinics
1. Local Christmas Seal Association pays full cost of x-ray and clinical supervision	181
2. Local Christmas Seal Association pays for x-ray and clerical work but province pays for clinical supervision	29
3. Free travelling clinics maintained by province	43
4. Free clinic supported by municipality (Windsor)	1
5. Free clinic supported jointly by municipality and provincial Tuberculosis Association (Hamilton 2; London)	3
6. Patients pay if possible (Toronto)	7
7. Free veteran clinic supported by federal department (Sunnybrook, Toronto)	1

All survey units mentioned above provide free chest x-rays for special groups such as food handlers, students who respond negatively to tuberculin tests, residents of homes for the aged or mental institutions and nurses.(1) A program of routine pre-employment testing is being expanded. In some areas industry pays for miniature chest plates; elsewhere local Christmas Seal committees meet this cost. Contacts are checked and local health departments or the patients' physicians are responsible for investigating the source of infection of all cases discovered by x-ray units.

Under the Silicosis Act and its Regulations, the provincial Division of Industrial Hygiene conducts routine surveys of all industries (except mining) where dust hazards exist. Each industry is checked roughly every 18 months; where indicated, visits are made every four months to check new employees and follow up cases recommended for observation. Management pays a fee of one dollar per plate for routine and repeated tests. In two areas this work is delegated to local agencies.

Following the inception of the Tuberculosis Control Grant, the Ontario health department undertook to sponsor routine chest x-rays for hospital admissions. By 1954, special equipment had been installed in 120 of the larger institutions and nearly every general hospital and five privately owned were cooperating.(2) A hospital receiving miniature equipment accepts full responsibility for its operation and maintenance and charges the patient a dollar per plate. The Workmen's Compensation Board, Blue Cross organization and other agencies providing hospital insurance have agreed to pay the fee for their own beneficiaries, while the province pays for indigents out of health grant funds. The province subsidizes small hospitals (where the installation of miniature equipment is unwarranted) on the basis of two dollars per film taken with their own standard equipment.

In 16 large urban centres, hospital outpatient departments provide routine chest x-rays to all initial contacts and annually thereafter. Fees are paid by the province.

---

(1) The Sanatoria for Consumptives Act and the Public Hospitals Act both require that all nurses - student or graduate - be x-rayed at specified intervals.

(2) In 1953, 79 percent of all hospitals reported a coverage of 70 percent of all patients or more; a total of 325,000 patients were x-rayed by in and outpatient departments.

Ontario has no province-wide B.C.G. vaccination program but advocates the use of vaccine for persons who respond negatively to tuberculin tests, especially among such groups as hospital personnel and others exposed to infection. Vaccine is supplied free to hospitals and physicians.

Treatment. Of the 14 sanatoria in Ontario, 12 are controlled and operated by boards of directors elected by and from the membership of various voluntary tuberculosis and sanatoria associations; one is operated by a religious order and the other by the United Counties of Dundas, Stormont and Glengarry. Each board of directors includes a representative of the provincial government. In addition to the 14 sanatoria, special hospital units provide care for children of the Toronto, Hamilton, London, Fort William, Ottawa and Sudbury areas and one Toronto institution, the Daughters of the Empire Convalescent Hospital which provides 100 beds for tuberculous children, is maintained as a sanatorium under a temporary charter.

In 1953, institutional accommodation was sufficient to care for all patients in need of in-hospital treatment.(1) Surgical cases were sent to the sanatoria at Hamilton, Toronto, London, Gravenhurst, Fort William and Ottawa where facilities are available. The tuberculous cases found among the mental hospital populations are transferred to The Ontario Hospital at Woodstock where 600 beds are maintained for this purpose.

The Ontario government pays for most sanatorium treatment. In 1953, only five percent of the total expenditures were met from patients' fees.(2) The province reimburses sanatoria according to services rendered - the more extensive the services provided, the higher the per diem grant. The cost of antibiotics such as streptomycin, paramino-salicylic acid and isoniazid is charged against the Tuberculosis Control Grant and supplied free to all patients who need them.

---

(1) On December 31, 1953, the numbers of treatment beds were reported as follows:

Type	Number
Sanatoria for general patients	4,367
Ontario (mental) Hospital, Woodstock	600
Indian Health Services, Moose Factory and Sioux Lookout	210
Total	5,177

(2) There is no means test. Patients with means may contribute to maintenance should they so desire. Sanatoria can collect up to three dollars per day and still receive a provincial grant; if over this amount, the grant ceases.

Pneumothorax refills and pneumoperitoneum treatments for ex-patients are supplied without cost at 78 refill centres. This is a cooperative project under which the sanatoria train physicians who do the work, the municipality pays transportation costs for the patient and the province loans the necessary equipment and pays the physician six dollars per refill (1954). The province insists that such patients receive periodic x-rays and pays three dollars per film.

Rehabilitation. A rehabilitation program available to both sanatoria patients and discharged cases has been initiated with federal aid. Services are under the direction of a rehabilitation officer and three assistants at head office; branch offices have been formed in Kingston, North Bay and London. Suitable work is found for all ex-patients desirous of employment whether or not they have received training under the program.

Public Education. The most valuable public educational activities are associated with the annual Christmas Seal campaigns. Literature is distributed widely; posters, films, press and radio are common media. In 1951, a pamphlet "The Story of the Lorraine Cross" was sent to 30,000 school teachers. All schools of nursing receive copies of "Safer Ways in Nursing" and a handbook dealing with tuberculosis problems is sent to all public health nurses.

Research and Training. Among the research projects conducted by the Connaught Laboratories are investigations of the effects of various antibiotics, B.C.G. vaccination and collapse therapy.

Sanatoria and hospitals provide courses in tuberculosis nursing to nurses-in-training and to nursing aides. They also participate in research activities, especially in the applied field directly related to control measures.

MANITOBA. Anti-tuberculosis control dates back to the establishment of the Manitoba Anti-Tuberculosis League in 1907 and the construction in 1910 of the Manitoba Sanatorium, a cooperative project undertaken by the new League and the Manitoba Board of Health. In 1929, under the Tuberculosis Control Act, the League was incorporated as the Sanatorium Board of Manitoba and became responsible for administering all provincial programs.

In 1950, the Sanatorium Board included the Minister of Health and four members appointed by him, the Municipal Commissioner and from 4 to 14 members elected by the various groups active in this field.(1) The Board arranges Christmas Seal campaigns, collects funds, correlates the work of various agencies, establishes standards of care and supervises the operation of sanatoria, clinics and x-ray units.

Costs of diagnostic and treatment services for both pulmonary and non-pulmonary tuberculosis and of all drugs are paid through public funds. Preventive and rehabilitation services are financed mainly from Christmas Seal collections, funds raised by other voluntary associations and the federal grant.

Case-finding and Diagnosis. The Sanatorium Board operates a number of stationary and mobile chest clinics for initial diagnosis or routine examinations at subsequent stages of the disease. Most important is the Central Tuberculosis Clinic in Winnipeg, where laboratory, radiological and other diagnostic services are available and where a 50 bed hospital is maintained for observation purposes. The member of the Sanatorium Board who directs all preventive services in the province is attached to the central clinic where he assists in organizing mobile x-ray surveys and the work of travelling clinics, interprets chest plates submitted by both, and controls the B.C.G. vaccination program.

All sanatoria provide clinical facilities readily accessible to local practitioners. Travelling clinics have been increasing; the teams attempt to visit areas remote from sanatoria every month and especially outlying regions settled by Metis where the incidence of tuberculosis is high. Extensive clinical services have been provided for reservation Indians and outpatient departments are maintained by all Indian sanatoria.

Clinics, local health units and the public nursing service keep in touch with known cases of tuberculosis, ex-patients and contacts; their work is greatly facilitated by the Central Tuberculosis Registry maintained by the province. All sanatoria admissions and discharges and all clinic cases are reported regularly and the Registry, in turn, notifies field personnel of newly reported cases.(2)

(1) A medical committee has been appointed to advise the Board.

(2) An Indian Tuberculosis Case Register was established in 1950. In addition to Manitoba cases, it includes 900 patients from Western Ontario, covering the Ontario region as far east as Chapleau.

The Sanatorium Board maintains two mobile x-ray units and the city of Winnipeg has a stationary unit for surveying special groups in the metropolitan area. All chest plates are interpreted at the central clinic. By 1948, free x-rays had been made available to all Manitobans. Since that time survey teams have concentrated on the more sparsely settled areas where the incidence of disease is higher and have cooperated with various authorities in x-raying special groups. Under federal direction, reservation Indians are surveyed yearly; in Winnipeg, the Municipal Health Department has arranged surveys of local industrial groups, high school and university students.

A program of routine x-rays for hospital admissions has received active support and a substantial part of the province's Tuberculosis Control Grant has been used to install miniature x-ray equipment in the larger institutions and to subsidize smaller hospitals which use their own machines. In 1953, 55 hospitals participated, x-raying all admissions, some outpatients and hospital staff. At that time over 65 percent of all admissions in the province were covered.

B.C.G. vaccination is not widely used in Manitoba. It is generally limited to persons exposed to infection who respond negatively to tuberculin tests. The most extensive use of vaccine involves the Indian population; most Indian children of school age and all preschool Indian children in Southern Manitoba and to a more limited extent in northern areas are tested and vaccinated. On house visits or at the time of payment of treaty money, babies born recently are also vaccinated.

Treatment. In addition to inpatient accommodation provided by the Central Tuberculosis Clinic, the Sanatorium Board maintains a sanatorium at Ninette and operates three federally owned sanatoria for Indians. Another hospital at St. Boniface is owned and operated by a religious order; the province, however, cooperates in providing certain facilities and consultation since all orthopaedic services are centralized here. Until 1954, Winnipeg maintained a municipal institution, the King George Hospital, but this has now been converted to other uses.

The growth of sanatorium accommodation and the optimum use of all beds, assured by a central admitting system, have eliminated waiting lists. In fact, by 1954 it had become possible to transfer all patients from the municipal sanatorium in Winnipeg to other institutions. Treatment services have improved generally and surgical facilities have been installed in all sanatoria.

In Manitoba, legislation provides that an infected person may be committed to a sanatorium if he is "a menace to public health" and generally no case is discharged while the disease is still in an active stage. The cost of treating both pulmonary and non-pulmonary cases is paid from public funds. All sanatoria as well as the central clinic, mobile units and physicians, give pneumothorax treatment to outpatients. In districts lacking clinics, physicians receive a fee of five dollars per treatment, charged against the federal grant.

Rehabilitation. As noted earlier, the Sanatorium Board is responsible for rehabilitation as well as other services. Programs of all sanatoria, directed by a rehabilitation officer, are financed through Christmas Seal and federal funds.

Programs aim primarily at providing inpatients with vocational guidance and academic instruction in order to raise their educational standards so that they may benefit by vocational training following discharge. The Department of Education makes correspondence courses available and some occupational training is given by qualified instructors. The Sanatorium Board uses the facilities of the Manitoba Technical Institute for post-sanatorium training and co-operate with the National Employment Service in placing ex-patients.

The Department of Public Welfare assists families whose breadwinners are hospitalized. Indigent patients receive assistance throughout the treatment and rehabilitation periods.

Public Education. Most public educational activities are associated with the Christmas Seal campaigns and mass x-ray surveys. The usual media are employed to inform the public and to convey up-to-date information to doctors, nurses and other professional personnel.

Training. Several teaching hospitals are affiliated with the Manitoba Sanatorium where their student nurses receive training in the bedside care of tuberculosis patients. The sanatorium also provides a short course for licensed practical nurses. Medical students are instructed at the Central Tuberculosis Clinic.

SASKATCHEWAN. Saskatchewan's tuberculosis control activities began in 1911 with the incorporation of the Saskatchewan Anti-Tuberculosis league. Following a successful fund-raising campaign, construction was begun on the first sanatorium, opened in 1917. Three years later the Imperial Order Daughters of the Empire added a children's pavilion.

As the work expanded various changes occurred. In 1924 ownership of the sanatorium was transferred to the province but the League continued to be responsible for the prevention and treatment programs. Two more sanatoria were erected - one at Saskatoon in 1925 and another at Prince Albert in 1930. Just a year before the last construction, tax-supported or "free" treatment was initiated for all tuberculosis patients.

From time to time during this period changes were also made in the method of financing. In the early days patients able to do so paid for their own care at a rate of $2.50 per day; the province contributed 50 cents per patient-day; municipalities supported their own indigent cases and the I.O.D.E. financed the care of children of indigent parents. In 1929 when the "free" tax-supported program was introduced, the I.O.D.E. undertook to care for the infants of tuberculous mothers in a special preventorium at Fort Qu'Appelle. Under the tax-supported scheme, operating funds derived from levies on rural and urban municipalities were supplemented by a provincial grant of one dollar per patient-day while the federal government paid the entire cost for such patients as came under its jurisdiction (Indians, veterans and so on).(1) Until 1948 educational and preventive services were financed through voluntary subscription; since then, funds have been supplemented through the Tuberculosis Control Grant.

The Saskatchewan Anti-Tuberculosis League, a quasi-governmental organization, is the official agent of the province authorized to operate all control programs. It is administered by a board of 19 directors comprised of 5 appointees of the provincial department, 9 representing rural and urban municipalities and the remainder representing unorganized territories, the medical profession and the general membership. The board appoints a director of medical services who also serves as general superintendent of sanatoria, and a medical superintendent for each hospital. A secretary, responsible to the director, supervises the operation of mass x-ray surveys, the collection of levies and the funds for prevention programs.

Case-finding and Diagnosis. Suspected cases, contacts and ex-sanatorium cases are examined periodically at the weekly clinics held in Regina and Moose Jaw and at monthly clinics convened in certain general hospitals. In 1924 travelling

(1) In 1950 the provincial grant was raised to $1.50 per patient-day and the following year to $2.00.

clinics were initiated to visit the more isolated districts. When community-wide miniature x-ray surveys were begun in 1941, however, the earlier methods were gradually discontinued. In 1943, three miniature x-ray units each directed by a physician, were in operation but were subsequently replaced by larger self-contained units purchased through voluntary subscription. By 1952, mass surveys had covered the province three times. Since the inception of the National Health Program, the provision of additional personnel and equipment has greatly extended this work. Auxiliary equipment such as panel trucks has been purchased for use not only in mass surveys but also for work in areas inaccessible to the usual transportation media.

In the northern two-thirds of the province which is gradually being settled as natural resources are exploited, the entire population numbers little more than 10,000 of whom 4,000 are Indians. In these areas, outpost hospitals have installed x-ray equipment and ship their plates by air to the provincial sanatoria for interpretation. The League, in cooperation with federal authorities, has conducted mass x-ray surveys, using standard films and, with federal aid, has employed a nurse who spends most of her time in the north. In all these areas, where the rate of infection is high and active cases are numerous, tuberculin testing has been used extensively.

Over the past decade, a tuberculosis mortality and morbidity survey has been made of all municipalities in the province, enabling authorities to compare the incidence of the two five year periods, 1944 to 1948 and 1949 to 1953. As a result, it has been possible to indicate the areas in need of more intensive coverage.

In 1948, a program for screening general hospital admissions was initiated. As in other provinces, miniature x-ray equipment has been installed in the larger institutions while smaller hospitals are subsidized for the use of their own standard equipment. Most plates are interpreted at the three sanatoria. In 1952, 83 hospitals participated in this program.

Through arrangement with the Department of Education, teachers at the tuberculosis clinics are x-rayed periodically. Special surveys have also been made at the university and teacher-training institutions. Until recently League teams conducted mass surveys among the Indians but now federal authorities have taken over this work. However, League personnel continue to interpret the plates and to reserve a large proportion of sanatorium beds for treating Indians.

Saskatchewan initiated a B.C.G. vaccination program for all student nurses in 1933 and for sanatorium employees in 1938. Since 1950 the programs have been expanded, especially in relation to tuberculin testing and x-raying of special groups such as negative cases in areas with high infection rates and Metis. Federal authorities make special efforts to x-ray and test all Indian children in residential schools.

Treatment. Free treatment is provided to all tuberculosis patients in Saskatchewan. Sanatorium accommodation has varied little in recent years, remaining at around 800 beds. This number has been adequate; no cases have been refused admission and there is no waiting list for the white population. Surgical therapy and the use of antibiotics have been extended significantly.

Sanatoria maintain close contact with ex-patients who are recalled for routine examination three months after discharge and observed for a minimum of seven years. On request of superintendents, public health nurses make follow-up visits to ex-patients' homes. League clinics and a few private physicians administer pneumothorax and pneumoperitoneum treatments to those who require them but in recent years such cases have decreased in number.

Rehabilitation. Medical superintendents of sanatoria direct rehabilitation services on an informal basis. They, themselves, serve as counselors, determining the kind and amount of training desirable. The Department of Education provides correspondence courses and full-time teachers give instruction in elementary and high school subjects. Vocational and arts and crafts teachers are employed with the help of federal grants.

The League has maintained that in this primarily agricultural province rehabilitation is not an extensive problem for the majority of patients return to their former occupations. Help has been given to cases where retraining is desirable. Perhaps the key factor in reducing the need for rehabilitation is the fact that the League has always stressed prevention and hence most cases are discovered at an early stage of infection. When necessary, the Department of Social Welfare and Rehabilitation assists discharged patients and their families and through an informal arrangement the League makes available limited financial aid to discharged patients who are unable to work.

Public Education. Most public educational work is associated with the sale of Christmas Seals and with the mass surveys when thousands of Saskatchewan residents volunteer to help

with publicity. The fund-raising activities of the Associated Canadian Travellers include publicity and educational work in which five radio stations cooperate. As in other provinces, the League distributes literature to schools, doctors, nurses and the general public and publishes a monthly magazine dealing with various aspects of tuberculosis control.

Training. The University of Saskatchewan instructs undergraduate medical students in diagnostic and treatment procedures and provides clinic experience. Special courses are arranged for nurses-in-training at ten hospitals and for nursing aides.

ALBERTA. Alberta's tuberculosis control work was expanded in 1925 when the government took over the operation of the Central Alberta Sanatorium, with the municipalities paying hospitalization costs. The province also assumed responsibility for providing diagnostic clinic services at selected centres. In 1936 sanatorium treatment became free for pulmonary cases.(1) At this time, too, a separate Division of Tuberculosis Control was established and treatment units in general hospitals were designed to supplement the existing facilities.

In 1943, the Alberta Tuberculosis Association presented the first mobile x-ray unit to the province; another was donated two years later. The province supplied the necessary funds and personnel for mass surveys while the voluntary association established a rehabilitation program of vocational and handicraft training.

Case-finding and Diagnosis. The Division of Tuberculosis Control directs all diagnostic services and makes consultation available to medical health officers, hospitals and private practitioners. Clinics, staffed by sanatoria personnel, convene weekly at Edmonton and Calgary and usually once a month at seven other centres. The Association's Nursing Service employs four public health nurses, three of whom serve the stationary clinics at Calgary, Edmonton and Lethbridge. In areas lacking clinics, hospitals and private physicians x-ray suspected cases and send the plates to the provincial division for diagnosis.

(1) It was not until 1949 that treatment was made free to non-pulmonary cases. From 1949 to 1954 the costs were charged against the Tuberculosis Control Grant but in 1954 the province assumed the entire cost of treatment for all patients.

In 1947 the mass x-ray surveys were placed under the supervision of a full-time director, employed by the voluntary association and responsable for arrangements and publicity; the province, however, has continued to supply other personnel, to maintain records and do follow-up work. Units serve all parts of the province giving special attention to areas with a high incidence of disease.

A year later the Association introduced routine x-rays for hospital admissions. Several hospitals tried using attachments to standard equipment but these proved less efficient than anticipated so the volunteer group purchased miniature machines for the larger institutions.(1) In 50 smaller hospitals, all admissions are tuberculin tested and positive reactors are x-rayed with standard apparatus. Apart from a fixed charge to the patient of 50 cents per plate, the Association finances the entire cost of this service.

The Division of Tuberculosis Control conducts a program combining tuberculin testing with x-ray of negative reactors among school children. Local medical officers, public health nurses and school nurses cooperate in this work. B.C.G. vaccination is also used for student nurses, Indians and Eskimos.(2)

In Calgary, Edmonton and Lethbridge public health nurses employed by the Association trace suspected cases and contacts; elsewhere, similar work is done by the regular district and rural public health nurses assisted by the Association's nursing consultant who tours the province regularly.

Treatment. The advent of free treatment increased the case-load of sanatoria, especially of non-pulmonary cases. In 1952, however, the new Aberhart Sanatorium at Edmonton replaced former treatment beds in hospital units in that city and increased accommodation by 95 beds, thus eliminating the waiting list. A new 96 bed unit was also opened at the Provincial Mental Institution in 1953 to care for tuberculous mental cases.

As in other provinces, surgical facilities at the Central Alberta Sanatorium have been improved through the acquisition of additional specialist staff and equipment. Drugs are free to all patients and the health department provides free pneumothorax treatment to all ex-patients through sanatoria clinics and private practitioners.

---

(1) Alberta is the only province where admission x-rays are financed through voluntary effort. By 1952, 22 machines had been donated to hospitals.

(2) Hospital regulations demand that all nurses and attendants receive adequate protection through tuberculin tests and x-rays.

When necessary, municipalities assist families whose breadwinners are in sanatoria. In many instances - and especially where there are children - the voluntary association supplements relief allowances to provide milk, cod liver oil and other necessities.

Rehabilitation. As mentioned earlier, rehabilitation work is a function of the Alberta Tuberculosis Association but various agencies cooperate in providing an extensive service for all cases. Shortly after a patient is admitted to a sanatorium, work is begun in the form of interviews and vocational guidance. Academic and commercial courses are available to all who can profit by them and the province employs teachers to give elementary instruction to children. Financial assistance is available as required.

Discharged patients may receive training at commercial schools or under the Canadian Vocational Training Act. The Association gives financial assistance during the training period. Efforts to expand job opportunities for discharged patients have also been increasingly successful.

Public Education. Public education is carried out chiefly through Christmas Seal campaigns and mass x-ray surveys. The Association sponsors essay contests for school children and exhibits films to a variety of public and private organizations. The nursing consultant, too, is active in educational work.

Training. Both the Alberta Tuberculosis Association and the federal government have encouraged professional education through various grants. Bursaries are available to graduate nurses and doctors and an annual fellowship is awarded to a recent graduate in medicine for further training in the Central Alberta Sanatorium. To fourth year medical students, a prize of $100 is awarded for the best essay on tuberculosis. Student nurses receive affiliate training in bedside care; instructors are paid through federal grants. Courses are also available to nursing aides.

BRITISH COLUMBIA. British Columbia's Department of Health and Welfare organized a Division of Tuberculosis Control in 1935 with administration centralized in Vancouver.(1) A

(1) The Health Branch of the provincial Department of Health maintains a separate office in Vancouver, directed by an assistant health officer responsible for liaison with voluntary agencies and the work of the Bureau of Special Prevention and Treatment Services which includes the Divisions of Laboratory Services, Tuberculosis Control and Venereal Disease.

part-time director was appointed and existing facilities supplemented through additional treatment beds, stationary and travelling clinics and a consultative service for physicians practising in areas which lacked clinics. Within the next two years supervisors of social services and nursing were appointed to carry out a joint program of family case work. Under direction of the new appointees, special surveys including both x-ray and tuberculin testing were conducted among high school students and in industry. In 1943, the British Columbia Tuberculosis Association purchased mobile x-ray equipment to be used by the province. The various programs were further consolidated in 1951 when the divisional director became a full-time appointee with permanent headquarters at the Willow Chest Centre in Vancouver.

Case-finding and Diagnosis. At the present time (1954) extensive clinic services have made it possible to examine all known tuberculosis cases, suspects and contacts as frequently as it is considered necessary. A medical records' librarian maintains a central case register and a special committee ensures the best use of all statistics.

Outside the sanatoria, the general Public Health Service is responsible for the control of active cases and the follow-up of suspects and contacts and assists with the organization of surveys. In metropolitan areas and health units, clinics report examinations and recommendations to the public health nurse who visits families and traces contacts. The provincial division employs a district nursing consultant for liaison with health units.

Suspected tuberculosis cases and contacts referred to the provincial division are examined at either the stationary or mobile diagnostic clinics. Stationary clinics are associated with the various treatment units while travelling clinics operate in the interior, Kootenay and coastal regions and in some parts of Vancouver Island. The only clinic served by a full-time physician is the Kootenay; elsewhere, the travelling clinic teams convene in a treatment unit and are served by resident physicians. The more inaccessible areas are visited only intermittently but a consultant service is provided for local practitioners who send x-ray plates to the nearest sanatorium for diagnosis.

From 1943 to 1950, the Division operated three mobile units financed by voluntary groups. During that period local health unit personnel spent considerable time in organizing the surveys and the question was raised whether, in view of the high operating costs and the small number of cases discovered, other case-finding methods might not be more

profitable. An ensuing analysis revealed that this technique was as efficient as any and mobile surveys were established on a permanent basis. The British Columbia Tuberculosis Society donated a new unit; operating staff continued to be provided by the province which also interprets the films and sends reports on findings to the local units for follow-up. Operating costs are charged against the Tuberculosis Control Grant.

To reduce the work load of the local health units, the voluntary society has employed a full-time organizer to arrange and publicize the surveys and to secure local voluntary help for canvassing and secretarial work. In addition to serving the health units, mobile teams have in the past conducted routine examinations of all secondary school students in Vancouver and of employees in many industries. In 1953, however, the routine examination of high school students was discontinued as an ineffective case-finding method.(1)

Routine x-ray of hospital admissions and outpatients is well established. As in other provinces, miniature x-ray equipment has been installed in 34 of the larger hospitals with federal aid(1953) and 36 smaller hospitals are subsidized at a rate of two dollars per plate taken with standard machines.(2) There has been a tendency for the smaller hospitals to lag behind in this program; to overcome this, the Association established a special unit to work with the organizer in stimulating hospitals to make the best possible use of x-ray facilities.

Tuberculin tests, followed by further investigation of positive reactors, form a part of the routine examinations of primary school children. B.C.G. vaccine is being administered to an increasing number of contacts including children and hospital employees.

Treatment. Although the sanatoria have always admitted all types of pulmonary tuberculosis, cases requiring active treatment or related to public health problems receive priority. Non-pulmonary cases with pulmonary involvement are also admitted. Outside the sanatoria the number of known active cases has declined steadily as treatment facilities have expanded.

(1) Through the cooperation of the Royal Canadian Navy, x-rays were made available to residents in coastal areas during 1953.
(2) In 1953, 68,000 admissions and 31,875 outpatients were x-rayed with miniature equipment and 9,642 with standard machines.

Accommodation which had been inadequate for many years has been increased through new construction so that by 1953 all patients could be admitted immediately except those scheduled for elective surgery.(1) The voluntary association which operates the Vancouver Preventorium cares for tuberculous children but the province controls admission and medical therapy.

The chief surgical and exploratory facilities are concentrated in the Willow Chest Centre to which patients from two Vancouver hospitals and from the Vancouver Island Chest Centre in Victoria are transferred. In 1949, facilities at the Willow Chest Centre were expanded through the addition of surgeries and an auditorium, financed by the British Columbia Tuberculosis Association(2), more staff and equipment were provided with federal aid. The provincial Division of Laboratory Services extends services to the Division of Tuberculosis Control, as needed.

The province bears most of the cost of hospital care for pulmonary tuberculosis but patients are expected to pay according to their abilities.(3) Municipalities pay 20 percent of the maintenance cost for social assistance recipients, indigents and others unable to pay for medical care who reside in organized territories while the province pays the other 80 percent; in unorganized areas the province meets the entire cost. The federal government maintains its own hospitals for Indians and remunerates the province for the care of veterans, most of whom are treated in the provincial sanatoria. In Victoria, the two inpatient tuberculosis units are associated with general hospitals which supply certain services, financed by the province.

All provincial clinics give free pneumothorax treatments. In areas where clinics are infrequent, private physicians are paid to perform this work in specially equipped hospitals. Physicians and local health units receive streptomycin free of charge and in 1952 public health nurses assumed responsibility for administering it to home care cases.

The province's welfare branch maintains a Bureau of Social Welfare within the tuberculosis division. Through

---

(1) In 1953, 20 patients awaited surgery.
(2) Christmas Seal funds paid for the entire cost of the new building which amounted to almost $500,000.
(3) In 1953, $80,000 were collected from patients.

it, assistance is provided for families whose breadwinners are hospitalized;(1) additional allowances for rent and special diets may be given to indigent patients. During the four year period from 1948 to 1952, Vancouver experimented with a homemaker service for tuberculosis patients. This federally sponsored experiment proved both socially and economically sound.(2)

Rehabilitation. The British Columbia Tuberculosis Society was responsible for rehabilitation work until 1949. At that time, the program was taken over by the Division of Tuberculosis Control and full-time rehabilitation officers were employed with federal aid. Official personnel provide academic and vocational courses for inpatients and voluntary organizations make instruction available to ex-patients. When necessary, the Society assists patients financially.

Public Education. A full-time director of education on the staff of the British Columbia Tuberculosis Society organizes educational work, employing the usual media. Literature is distributed to teachers and nurses, lectures are given to students and nurses and films are made available through the organization's film library. Special efforts are concentrated on publicity in connection with hospital x-ray programs. A free magazine "Your Health" is produced and circulated to all patients.

Training. The Director of Nursing Services is responsible for nursing education in general and for ascertaining that nurses receive training in the care of tuberculous patients. She ensures uniform training procedures for all institutions and advises teaching staffs regarding both professional and practical problems. The British Columbia Tuberculosis Society provides a $3,000 bursary for graduate work at the province's university.

The National Health Program has encouraged graduate training of both doctors and nurses. A number of physicians have received specialist certificates or attended refresher courses at various Canadian and American centres.

(1) The municipalities pay 20 percent of the cost of this service.
(2) B.C. Dept. H. & W., Report of the Social Welfare Branch, 1952, 103.

THE COST OF TUBERCULOSIS PROGRAMS

It is impossible to determine the precise cost of tuberculosis services in Canada. However, on the basis of data provided by the Dominion Bureau of Statistics and provincial health departments, the Research Division of the Department of National Health and Welfare has been able to produce some estimate. According to this, roughly $45,300,000 were spent on all types of tuberculosis services during the calendar year, 1953. Of this amount, about $40,000,000 were expended for the hospitalization of tuberculous cases in sanatoria, special units in general hospitals and federal institutions. Voluntary agencies spent approximately $2,000,000 on their case-finding and welfare programs, and all governments expended roughly $3,500,000 on case-finding, diagnostic, home nursing and welfare services.(1)

TABLE 8. EXPENDITURES OF NON-FEDERAL SANATORIA IN CANADA: BY CALENDAR YEAR, 1948 TO 1953

Year	Expenditure in $ Million
1948	17.0(a)
1949	19.2
1950	22.1
1951	26.8
1952	29.2
1953	32.2

(a) Excludes Newfoundland

Sources: D.B.S. Tuberculosis Institutions, 1948 to 1952.
D.B.S. Tuberculosis Statistics, 1953.

(1) At the present time, no reliable information is available regarding the construction costs of accommodation; however, during the fiscal years 1948-49 to 1953-54 inclusive, federal grants for this purpose amounted to $4,761,000.

TABLE 9. REVENUE OF TUBERCULOSIS SANATORIA IN MILLIONS OF DOLLARS: BY SOURCE AND CALENDAR YEAR, 1948 TO 1953

	1948	1949	1950	1951	1952	1953
Provincial Governments(a)	11.2	13.0	15.7	17.6	20.4	23.4(b)
Municipal Governments	1.8	1.7	2.0	2.4	1.7	1.6
Federal Governments	1.7	1.9	2.1	2.3	2.8	3.0
Paying Patients	0.6	0.6	0.6	0.7	0.7	1.0
Workmen's Compensation Boards and Other Contracts	0.1	0.1	0.1	0.2	0.4	0.7
Other Operating Revenue	0.1	0.2	0.4	1.1	0.7	0.5
Special Revenue(c)	1.4	1.4	1.4	1.7	1.7	1.9
All Sources	16.9	18.9	22.3	26.0	28.6	32.1

(a) Includes payments made by province to sanatoria from federal grants allocated through the National Health Program.
(b) See footnote 2, page 78.
(c) Includes income from investments, contributed services, Christmas Seal campaigns and other sources.

Source: D.B.S. Tuberculosis Institutions, 1948 to 1952.
D.B.S. Tuberculosis Statistics, 1953.

TABLE 10. REVENUE OF NON-FEDERAL SANATORIA AND PERCENTAGE DISTRIBUTION: BY SOURCE AND PROVINCE, CALENDAR YEAR, 1953

Province	Provincial[a]		Municipal		Federal		Patient Fees		Other Revenue		Special Revenue		All Operating Revenue	
	$ Million	Per Cent	$ Million	Per Cent	$ Million	Per Cent	$ Million	Per Cent	$ Million	Per Cent	$ Million	Per Cent	$ Million	Per Cent
Nfld.	1.50	91.5	-	-	0.10	6.1	-	-	0.04	2.4	(b)	-	1.64	100.0
P.E.I.	0.29	87.9	(b)	-	-	-	0.03	9.1	0.01	3.0	(b)	-	0.33	100.0
N.S.	1.52	84.0	0.14	7.7	0.13	7.2	-	-	-	-	0.02	1.1	1.81	100.0
N.B.	2.10	96.3	-	-	0.04	1.8	0.02	0.9	0.01	0.5	0.01	0.5	2.18	100.0
Que.	6.38	75.1	(b)	-	0.50	5.9	0.64	7.5	0.18	2.2	0.79	9.3	8.49	100.0
Ont.	6.05	69.1	(b)	-	1.16	13.2	0.17	1.9	0.56	6.5	0.81	9.3	8.75	100.0
Man.	0.82	65.1	0.21	16.7	0.14	11.1	0.06	4.8	-	-	0.03	2.3	1.26	100.0
Sask.	0.57	25.9	0.83	37.7	0.56	25.5	-	-	0.15	6.9	0.09	4.0	2.20	100.0
Alta.	1.20[c]	73.6	-	-	0.30	18.4	-	-	0.04	2.5	0.09	5.5	1.63	100.0
B.C.	3.00	78.9	0.41	10.8	0.27	7.1	0.08	2.1	0.04	1.1	-	-	3.80	100.0
Canada[d]	23.43[e]	73.0	1.59	5.0	3.20	10.0	1.00	3.1	1.03	3.2	1.84	5.7	32.09	100.0

(a) Includes payments made by provinces to sanatoria from federal grants allocated through the National Health Program.
(b) Amounts of less than $10,000.
(c) Amount estimated by Dept. N.H.& W., Research Division.
(d) There are no sanatoria in Yukon or the Northwest Territories.
(e) Amount includes $1,200,000, estimated revenue from the Alberta government.

Sources: D.B.S. Tuberculosis Statistics, 1953.
Canada, Public Accounts of Canada, Vol. 1, 1952-53.

As recorded in Table 8, the cost of maintaining tuberculous patients in sanatoria (excluding federal) has increased steadily, rising from $17,000,000 in 1948 to $32,200,000 in 1953.(1) The source of these funds, shown in Table 9, derive chiefly from provincial governments; patients pay only 3.1 percent of the cost as indicated in Table 10. Municipal governments contributed 5 percent and federal authorities 10 percent, but these sources of revenue were utilized only in certain provinces.(2)

The average cost of maintaining a patient in a sanatorium has also increased.(3) By 1953 the cost per patient-day had reached $6.25 - an increase of 5 percent over 1952 and of 126 percent over the 1943 average.(4)

There are no direct estimates of expenditures made by voluntary agencies but, on the assumption that nearly all income is spent, it is estimated that expenditures of the Canadian Tuberculosis Association have risen from $1,500,000 in 1948 to nearly $2,000,000 in 1953.

---

(1) Excluding the expenditures of Newfoundland for both 1948 and 1953, the cost of sanatorium care rose from $17,000,000 in 1946 to $30,500,000 in 1953, an increase of roughly 80 percent

(2) It should be noted that the amounts received by non-federal sanatoria in each province and the source of funds are influenced by the federal government's method of caring for its patients. Thus, in provinces lacking hospitals maintained by either the Department of National Health and Welfare or the Department of Veterans Affairs, federal patients are admitted to non-federal institutions. Accordingly, totals for Manitoba, Alberta and British Columbia are lower than they would be if federal patients were admitted to provincial institutions as they are in Saskatchewan, Quebec and Ontario.

(3) This excludes federal sanatoria.

(4) D.B.S. Tuberculosis Statistics, 1953, 12.

PUBLICATIONS IN THE SOCIAL SECURITY
AND THE GENERAL SERIES

Research Division,
Department of National Health and Welfare

I. SOCIAL SECURITY SERIES

* Memorandum No. 1. Mothers' Allowances Legislation in Canada. 1st ed. May 1949, 2nd ed. January, 1955, pp.

* Memorandum No. 2. Old Age Income Security in New Zealand. March 1950. 41 pp.

* Memorandum No. 3. Old Age Income Security in Australia. March 1950. 31 pp.

_/ Memorandum No. 4. Old Age Income Security in Great Britain. March 1950. 84 pp.

_/ Memorandum No. 5. Old Age Income Security in the United States. March 1950. 76 pp.

_/ Memorandum No. 6. Old Age Income Security in Selected European Countries. (Denmark, France, Sweden, Switzerland). March 1950. 83 pp.

O Memorandum No. 7. Social Security in Australia.

* Memorandum No. 8. Health Insurance in New Zealand. October 1950. 88 pp.

* Memorandum No. 9. Health Insurance in Denmark. (Revised) March 1952. 67 pp.

* Memorandum No. 10. Health Insurance in Sweden. January 1952. 76 pp.

* Memorandum No. 11. Health Insurance in Great Britain, 1911-48. March 1952. 163 pp.

O Memorandum No. 12. Health Insurance in Norway. Est. 60 pp.

O Memorandum No. 13. Health Insurance in the Netherlands. Est. 65 pp.

* Memorandum No. 14. Government Expenditures and Related Data on Health and Social Welfare 1947 to 1953. 2nd ed. June 1955. 84 pp.

* Memorandum No. 15 Public Hospital and Medical Care Plans in Canada. July 1955. pp.

II. GENERAL SERIES

/ Memorandum No. 1. Survey of Dentists in Canada. 2nd ed., January 1949, 45 pp.

* Memorandum No. 2. Survey of Physicians in Canada. 3rd ed., Sept. 1948, 4th ed., Sept. 1949, 5th ed., June 1951, 6th ed., April 1955, 36 pp.

* Memorandum No. 3. Survey of Welfare Positions: Report April 1954. 182 pp. and appendices.

* Memorandum No. 4. Voluntary Medical Care Insurance: A Study of Non-Profit Plans in Canada, April 1954, 85 pp.

* Memorandum No. 5. A Study of the Functions and Activities of Head Nurses in a General Hospital. May 1954, 140 pp.

* Memorandum No. 6. Mental Health Services in Canada. July 1954, 207 pp.

* Memorandum No. 7. Changes and Developments in Child Welfare Services in Canada, 1949-1953. October 1954, 33 pp.

* Memorandum No. 8. Survey of Welfare Positions, Summary of Report. May 1955. 34 pp.

* Memorandum No. 9. Voluntary Medical and Hospital Insurance in Canada. August 1955. pp.

* Memorandum No. 10. Hospitals in Canada. September 1955. pp

* Memorandum No. 11. Tuberculosis Services in Canada. July 1955. 65 pp.

III. OTHER PUBLICATIONS

Bulletins prepared in collaboration with other Divisions of the Department or other agencies.

* Survey of Nursing Personnel in Manitoba, October 1952, 59 pp

* A Suggested Methodology for Fluoridation Surveys in Canada, July, 1952, 51 pp.

* Dental Effects of Water Fluoridation, 1954 Report, August, 1954, 33 pp

_/ Rehabilitation of Disabled Persons. Background Data for the National Conference on Rehabilitation, Toronto, Feb. 1 - 3, 1951, 135 pp.

* Social Security Expenditures in Australia, Canada, Great Britain, New Zealand and the United States 1949-50 - A Comparative Study, February, 1954, 42 pp.

Canadian Sickness Survey

V Special Compilation: No. 1. Family Expenditures for Health Services (National Estimates), May, 1953, 13 pp.

V Special Compilation: No. 2. Family Expenditures for Health Services by Income Groups (National Estimates), July, 1953, 13 pp.

V Special Compilation: No. 3. Family Expenditures for Health Services by Expenditure Group (National Estimates), September, 1953, 56 pp.

V Special Compilation: No. 4. Family Expenditures for Health Services (Regional Estimates), January, 1954, 23 pp.

V Special Compilation: No. 5. Volume of Sickness (National Estimates), April, 1954, 24 pp.

V Special Compilation: No. 6. Permanent Physical Disabilities (National Estimates), February, 1955, 15 pp.

---

* Available on request. _/ Out of print. O In preparation.

V Available from Queen's Printer, 25 cents a copy.